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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Chevrier, L.: Studies on the Cholæmia Following Anæsthesia and Methods of Modifying It. (Etude sur la cholémie post-anesthesique et sur les moyens de la modifier). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 735.

Since 1909 Chevrier has been engaged in the study of the effects upon the body of general anæsthetics. Patients were selected for this investigation who were as far as possible free from infection or other taint, and blood examinations were made before and at frequent intervals after anæsthesia.

In 74 cases in which chloroform was the anæsthetic used, cholæmia was found in all. This cholæmia was immediate and therefore may be termed a "cholæmia of inhalation" or "primary cholæmia."

Cholæmia was a constant finding also after ether anæsthesia, having occurred in all of 38 tested cases. This fact the author believes is more remarkable than the appearance of the condition after choloform anæsthesia for even a slight icterus is not observed after ether while it is frequently observed after the use of chloroform.

The author has made a number of investigations also upon the effects of certain substances in modifying the cholæmia following anæsthesia. Sugar, lipoid extracts, liver extracts, morphine, and combinations of these agents were tried in succession. The substance was administered by mouth or by subcutaneous injection before anæsthesia. The results obtained in each series of cases are given in tabular form.

In Chevrier's opinion, cholæmia following anæsthesia may have either a hepatic or a hæmic origin. The hæmolytic action of the anæsthetic would accord very well with the onset of cholæmia. Numerous observations have demonstrated to Chevrier unquestionably, however, that hæmolyzed blood alone does not give the reaction of the bile pigments. It is necessary not only that the blood be hæmolyzed but also that the dissolved hæmoglobin be transformed. Hæmolysis is instantaneous, but pigmental change is not. Therefore, as cholæmia is immediate, Chevrier believes that the part played by hæmolysis in cholæmia is slight.

Clinical findings, experimental and anatomopathologic research, and all therapeutic tests indicate that the main cause of cholæmia following anæsthesia is some injury from the anæsthetic to the liver. While the suddenness of the onset of cholæmia speaks rather against an attack of the anæsthetic upon the liver, Chevrier believes that such injury does occur and is produced in two stages. The first stage corresponds to the chloroform-inhalation cholæmia, i. e., the primary cholæmia. In this stage there is no cytologic lesion, only a vasomotor disturbance, hepatic congestion, and a disturbance of the osmotic equilibrium of the hepatic cells. Succeeding this stage is a cyto-hepatotoxic condition due to retention of the anæsthetic. If the hepatic cells are already injured, the state of cholæmia may be surpassed and a mild icterus may result. If the hepatic cells are hypersentitive or strongly permeated by the anæsthetic, the icterus may be severe. The greater the delay in the elimination of the anæsthetic, the greater the possibility of icterus. This explains why similar conditions do not appear after ether, the complete elimination of which is much more rapid than the elimination of chloroform.

Hepatic cholæmia may be described briefly as a primary cholæmia due to hepatic congestion with cellular depolarization and perhaps hæmolysis. Secondary cholæmia is due to cyto-hepato-toxic lesions with the presence of transformed pigments produced by hæmolysis.

Further research by the author shows that sugar and liver extract administered for one day diminish the cholæmia following choloroform anæsthesia to a minimum and cause the complete disappearance of the cholæmia due to the inhalation of ether.

W. A. BRENNAN.

Beck, E. G.: Bismuth Paste in Surgery. *Minnesota Med.*, 1919, ii, 157.

The author treats chronic suppurations due to disease and crushing injuries by means of a bismuth paste and finds that this treatment eliminates at least 65 per cent of all such suppurations after they have gone through the usual procedure of surgical treatment.

In order that the reader may fully understand the application of the bismuth paste, the article goes into some detail in describing a sinus or fistula. A sinus or fistula is nothing more than a shriveled abscess or abscesses. It leads from its opening on the skin down to the bone or joint or into the bowel, to the place where the disease originated, and this focus of disease is often at a considerable distance from the opening or openings of the sinus. It is therefore inconsistent to try to eradicate the suppuration by merely dissecting the sinus tracts. The focus must be removed first, the cavity disinfected, and the fistula or sinus injected with bismuth paste. The paste must be injected down to the focus of the disease and must fill up all sinuses or tracts.

The indications are enumerated as follows:

1. All sinuses resulting from chronic suppurating joint affections, tuberculous as well as non-tuberculous. This includes the sinuses following esp cia'ly spondylitis and hip-joint disease.
2. Sinuses following osteomyelitis of the long bones and flat bones, including the ribs.
3. Sinuses resulting from suppurative diseases of parenchymatous organs, such as the kidney and other glandular structures, including suppurative tuberculous glands.
4. Postoperative sinuses which sometimes remain after the draining of infected wounds.
5. Sinuses following empyema of the pleura or lung abscesses.
6. Cases of abscess and suppuration of the mammary glands.
7. All infected wounds which are due to crushing injuries.
8. Infected and long-suppurating war wounds due to shrapnel or bayonet injury.
9. Rectal fistulæ or pararectal abscesses.
10. Suppurative disease of the antrum and accessory sinuses, as well as in postoperative mastoid lesions.
11. Suppurative sinuses about the teeth and jaws in pyorrhœa alveolaris.
12. Chronic endometritis.
13. Cold abscesses. To prevent the formation of a sinus, the abscess should be incised and injected with a 5 per cent bismuth paste.

The author outlines the following errors in technique:

1. The method is often applied indiscriminately and without the control of radiograms.
2. The mixture when injected is not sufficiently liquified to fill all the sinuses and suppurating cavities.
3. The bismuth is applied when the cause of the trouble is either a sequestrum or infected foreign body.
4. The instruments used are often improvised and unsuitable.
5. The bismuth mixture is very often spoiled by the accidental admixture of a few drops of water.
6. The injections are kept up after the wound is sterilized and thus no chance is given for healing.

It is suggested that an examination of the secretions from the sinus be made before the first injection. Then, three days later, more cultures should be made to test the sterilizing effect of the injection. As long as the sinus contains microörganisms, it should be re-injected, but it is advisable to wait at least one week after the first injection before repeating it.

Acute suppurative processes should not be treated with bismuth paste—only chronic suppurations, both tuberculous and non-tuberculous.

Bismuth poisoning may be easily prevented by using smaller quantities. When larger quantities are required they should not be retained longer than ten days. P. H. KREUSCHER.

Van Hoosen, B.: Postoperative Analgesia. *Boston M. & S. J.*, 1919, clxxx, 556.

During the postoperative period the author uses measures similar to those applied in the obstetrical twil'ght sleep as follows: Morphine 1/32 gr. and scopolamine 1/200 gr. every four hours by hypodermic injection for twenty-four, thirty-six and, in very painful cases, forty-eight hours after operation.

Four hundred and fifty-two cases so treated in the Cook County and Mary Thompson Hospitals of Chicago are reported. The postoperative analgesia was found to be most beneficial to both the patients and the nurses alike. It greatly decreases complicating stomach symptoms, shortens the convalescence, prevents dread of future operations, and facilitates the work of the nurse. On being questioned as to the details of the first two days following operations, the patients were found to have had not only marked analgesia but also some amnesia. ARTHUR STEINDLER.

Regan, J. C.: Some Points Relative to the Technique of Lumbar Puncture in Children. *Arch. Pediat.*, 1919, xxxvi, 129.

Properly performed, lumbar puncture is such a simple operation on a child that at first thought it would seem unnecessary to deal with it in detail. Many practitioners, however, hesitate to perform rachicentesis, especially when the patient is being treated at home for fear of an unsuccessful result—the so-called "dry tap." There is no doubt that in many instances this hesitancy prevents a prompt diagnosis and proper treatment. It is therefore extremely important that the technique should be simple and easily followed. Regan has devised a technique which facilitates the performance of this operation in children.

In order to understand the principles upon which the various steps of the procedure are based, it is necessary to know something of the anatomical structure of the vertebræ in the young. At an early age the vertebræ are not distinct and separate bones connected by ligamentous attachments as in later life. The laminæ are rather short and wide and the interlamellar spaces are directed obliquely downward. The spinous processes are short, thick, and rather quadrilateral in shape, while the interspinous spaces are quite wide, especially when the body is well-flexed. The supraspinous ligaments are relatively strong and intimately blended with the cartilaginous tip of each spinous process. The termination of the spinal cord is lower in children than in adults.

In rachicentesis two routes of puncture are employed, the median and the lateral, depending on whether the needle is introduced directly between the adjacent spinous processes or laterally at a variable distance from them. With few exceptions, the median route is the most advantageous in children.

Clinically the operation is very easy in all young patients when the needle is inserted in a direction absolutely perpendicular to the spine, the back being well arched so as to increase the width of the interspinous spaces. Occasionally in children over 7 years of age, however, or when, owing to rigidity, the back cannot be well flexed, it is necessary to incline the needle very slightly at an angle of about 70 to 80 degrees with the spine.

The proper site for puncture is the fourth lumbar interspinous space, but in some cases it is necessary to insert the needle at a higher level.

In regard to previous preparation, a few writers believe that a cathartic should be given before the operation. Though rarely essential, this is useful and may well be done if the resulting delay is not a drawback.

If the patient is a small child and can be moved without pain, the best place to perform the operation is upon a table which is long and wide enough to accommodate the patient and high enough to allow for the comfort of the operator. The prone position is the most desirable. The child should lie on the left side with the legs well drawn up and the neck and shoulders well forward to cause as marked an extension of the back as possible.

Some authorities advocate the use of a general anæsthetic. If someone is at hand who can properly hold the patient, it can almost always be dispensed with. Various local anæsthetics have also been advised. As a rule, however, anæsthesia is not only unnecessary, but undesirable.

Asepsis is important. The instruments should be boiled for at least fifteen minutes. The operator should thoroughly scrub his hands with soap and water and rinse them in a solution of 5 per cent carbolic acid, a 1:1000 bichloride solution, or alcohol.

The site of puncture should first be thoroughly cleansed with green soap followed by alcohol, and after this has dried, the surface should be painted with iodine.

Technique: With the needle properly held in the right hand, the first point is its proper introduction. The desired interspinous space should be located and the thumb of the left hand placed deeply into the interspinous space below the spine of the fourth lumbar vertebra so that the finger nail makes a deep indenture just beneath the spine. The needle should then be introduced by the side of, and just below, the thumb.

Three things may occur as a result of the introduction of the needle: (1) the tap may be so-called "dry," (2) pure blood may flow from the needle, (3) cerebrospinal fluid, either clear or mixed with blood or pus, may be withdrawn. When spinal fluid is obtained, the amount to be removed depends upon the purpose for which the operation is being done. I the fluid is to be used for diagnostic purposes, 8 to 10 cubic centimeters is almost always sufficient. In cases of brain tumor, not more than 3 to 5 cubic centimeters should be removed.

For therapeutic purposes the quantity of spinal fluid removed is greater than for diagnosis and hence there is a greater element of danger, especially if the operation is not carried out with the patient in the recumbent position.

When sufficient fluid has been removed, the needle should be withdrawn in such a manner as to prevent oozing of cerebrospinal fluid along the tract of puncture. This is best attained by pressing the thumb deeply into the inner space as was done when the needle was inserted.

After removal of the needle, tincture of iodine should be applied to the site of puncture, and a sterile gauze or cotton pad held in place with adhesive strapping.

The instruments required for operation are a lumbar puncture needle, two or three glass test tubes, a measuring glass, and if serum is to be removed, a receptacle.

If the needle should break during its insertion a small incision may be made and the fragment grasped and withdrawn with a hæmostat. If the fragment cannot be located, an X-ray should be taken and operative procedures resorted to.

In cases of collapse during operation, Jelliffe and White advise the use of ether hypodermically, and after response, the administration of strychnine, adrenalin, and pituitary extract to prolong the stimulation. If this is not effective, the operation should be terminated and the patient given artificial respiration.

The child should remain in bed for at least twenty-four hours after the puncture. If the operation was performed for treatment, he should be kept in bed for forty-eight hours. G. W. HOCHREIN.

Foulkes, T. H.: A Simple Operation for Piles. *Indian M. Gaz.*, 1919, liv, 137.

The patient is prepared in the usual way and after being anesthetized the sphincter is dilated and a

plug inserted in the rectum to prevent contamination during the operation. Each pile is seized with a Spencer-Wells forceps and pulled down. The forceps on one pile is then held up and a Kocher forceps applied in such a manner that the whole length of the pile is included between the blades of the clamp. By depressing the handle of the Kocher forceps against the buttocks, a ridge of mucous membrane is raised above the point of the forceps. A suture is passed through this fold and tied. A forceps is then snapped to each end of the suture, and from either side of the pile just below the Kocher forceps the sutures are pushed through at about the center of the latter and tied around the lower end of the forceps as the Kocher is removed. The pile may now be cut away or left.

In this operation there is little or no bleeding, the pain is slight, and the patient is up and around in a short time. I. E. BISHKOW.

Ferrán, J. E.: Local Anæsthesia in Urgent Interventions and a New Operative Technique for Elephantiasis of the Legs (La anesthésia local en las operaciones de urgencia y una nueva technica operatoria para la elefantiasis de las piernas). *Rev. de med. y cirug.*, 1919, xxiv, 129.

Ferrán has performed pleurotomies, costal resections, and operations for inguinal and abdominal herniæ under local anæsthesia with very satisfactory results. Having been struck with the efficacy of local anæsthesia in dealing with the skin and cellular tissues, he decided to operate in cases of elephantiasis by this method.

According to the technique described, elliptical non-corresponding incisions several inches long are made longitudinally down the leg. The edges of the ellipse are then sutured together, the catgut passing through the skin and then through the edges of the underlying tissues without traversing them down to the muscle. In the depths of the muscle the needle is passed horizontally and out on the other side. Four or five catgut threads are used. This closure the author calls an "anastomotic inclusion." He does not insist on extirpation of the elephantiasic tissue as he has observed that it is very rapidly resorbed.

By the method of suturing described there is a veritable anastomosis of the lymphatics, arteries, and veins which act as true syphons, absorbing the lymph by the intimate relation effected between the dermis and the muscles. A small wick drain is inserted at the lowest part of the incision. The rapid absorption of the elephantiasic tissue is aided by the application of a strongly compressive elastic bandage. W. A. BRENNAN.

ASEPTIC AND ANTISEPTIC SURGERY

Skillern, P. G. Jr.: A Series of War Wounds Treated with Dichloramine-T. *Ann. Surg.*, 1919, lxix, 498.

In August, 1918, a depth bomb exploded prematurely on a United States ship at sea, killing four men and injuring twenty-three others. The more important injuries included perforation of bowel, 4; penetration of the lung, 7; laceration of femoral vessels, 2; laceration of the penis and scrotum, 2; laceration of the eyeball (extensive), 1; rupture of the eardrum, 8; fracture of the skull (occipital), 2; fracture of the mandible, 1; fracture of the humerus, 2; fracture of the radius and ulna, 1; fracture of the femur (incomplete), 1; fracture of the patella, 1; fracture of the tibia and fibula, 2; fracture of the tibia, 1; and fracture of the tibia (incomplete), 2.

This list by no means represents all the injuries, for there were numerous punctures and lacerating wounds of various soft parts. The fractures were for the most part compound and many were comminuted. In the entire group of patients, several hundred injuries had to be discovered and dealt with. The only deaths occurred practically immediately after the accident from the overwhelming shock of multiple extreme injuries. There was no operative mortality. The twenty-three survivors ultimately were either sent back to duty or honorably discharged from the service.

The chief purpose in reporting this series is to attest the value of dichloramine-T. The primary dressing in each case after the accident consisted solely in filling the wound with dichloramine-T and inserting a short length of rubber dam to maintain the patency of the drainage orifice. Over all there was then applied and secured a dry, sterile gauze pad.

The ship reached port five days after the explosion and on arrival the patients were transferred to a hospital. Several months after the accident the author was informed by the surgeons who attended these patients at the hospital that not a single wound had developed the slightest evidence of infection; cultures which were made from wound discharge invariably proved sterile.

Tubby, A. H., Ferguson, A. R., Mackie, T. J., and Hirst, L. F.: A Report on the Action of Flavine and Its Derivatives. *Lancet*, 1919, cxcvi, 838.

The writers conducted experiments to determine the action of flavine and its derivatives upon organisms in the blood-stream when administered intravenously. No definite curative influence could be demonstrated either with proflavine or acriflavine in bacillæmia, a result which is only what might be expected in view of the rapidity with which the flavine compounds are eliminated from the circulation.

By the use of a method which insures the gradual dilution of the flavine solution by the blood, the immediate effect of its agglutinating action on the red blood corpuscles can be prevented.

In vitro, flavine proved highly efficient as a disinfectant for blood if allowed time to exert its full action. E. B. FREILICH.

Lusk, W. C.: The Disinfection of Vitalized Tissues and the Healing of Wounds with Chinosol and Salt. *Ann. Surg.*, 1919, lxix, 493.

Chinosol is pure normal oxyquinoline sulphate. In vitro, though a powerful antiseptic, it is only slightly germicidal. A 2 per cent solution did not kill staphylococcus aureus in twenty-four hours. Its disinfecting action on vitalized tissues is probably due, therefore, to the excitement of physiological stimuli which increase the natural forces of resistance.

The author gives examples of cases treated with chinosol and salt. The tincture (2 per cent chinosol and 1½ grains of sodium chloride to the ounce in 80 per cent alcohol) applied once a day to the skin around a furuncle after the removal of all grease with a fat-solvent will prevent infection of neighboring hair follicles.

In suppurating and granulating wounds the solutions used contain 2 per cent of chinosol with either 0.85 per cent or 5 per cent of sodium chloride. The healing of blind tracts of soft parts may be facilitated by injecting the tracts once in six or eight hours through tubes having no punctures. For this purpose the 2 per cent chinosol solution with the 5 per cent salt content is probably the better solution of the two. For the control of sepsis in draining empyema, the solution of 2 per cent chinosol with the 5 per cent sodium chloride content is recommended. Following preliminary washing with salt solution, 1 ounce may be injected into the cavity daily and should be retained by posture.

First-aid treatment is effected either by packing the wound with gauze saturated with a solution of chinosol, 4 grains to the ounce and 0.85 per cent sodium chloride, renewed in twenty-four hours, or by simply sponging the wound freely with the solution during the operation for its immediate repair. The value of chinosol as a first-aid disinfectant was determined by animal experimentation.

The merits of chinosol in combination with salt as a tissue disinfectant may be summarized as follows: Stability; ease of application; applicability to first-aid treatment of wounds; a tendency to dry up pus; non-irritability when applied in accordance with the technique here advocated, unless possibly after prolonged use; and the facts that it appears not to attack tendons and facilitates the separation of sloughs. P. G. Skillern, Jr.

ANÆSTHETICS

Silk, J. F. W.: Anæsthesia; A Modification of the Open Ether Method. *Brit. M. J.*, 1919, i, 635.

Silk is of the opinion that the particular requirements of war surgery have given a great impetus to the use of ether as a general anæsthetic for routine work, and especially to its administration by the open method. Because of certain difficulties which inexperienced anæsthetists have encountered in the way of long induction, excessive amount of ether employed, and the objection of the patient to the taste and smell of "straight" ether, the author proposes a mixture of 1 dram of chloroform and 32 drams (4 ounces) of ether which is approximately 3 per cent of chloroform in ether or a very little stronger (3 in 99). The face pad and mask are the same as for open ether and the mask is closely applied to the patient's face from the beginning. The liquid is used exactly as if it consisted of ether alone, the presence of the chloroform being ignored.

The same care in watching and maintaining the breathing are required in this as in any other method of anæsthetization; it is not assumed that the plan is absolutely fool-proof.

The advantages claimed are: simplicity, rapidity of induction (five to ten minutes), lack of irritation, efficiency, economy, and safety.

The greatest expenditure of the liquid occurs during the induction stage and seldom exceeds a couple of ounces. For the maintenance of anæsthesia after the induction stage, it is estimated that from 4 to 6 ounces are ample.

While it cannot be claimed that this or any other anæsthetic is absolutely safe, the possibilities of over-dosage with chloroform are much diminished when the ½ dram required for induction is diluted in 2 ounces of ether and given in ten rather than in two minutes. Moreover the dram to a dram and one-half used in the course of an hour is not apt to do much harm. I. C. Herb.

Davis, N. C.: The Influence of Fasting and Various Diets on the Liver Injury Effected by Chloroform Anæsthesia. *Arch. Int. Med.*, 1919, xxiii, 612.

The author points out that as an introduction to a study of liver injury due to chloroform anæsthesia it is necessary to understand clearly how uniform the individual reaction to this drug is under uniform conditions. Data are submitted sufficient to convince a sceptic that the liver injury in a given dog will be uniform in extent provided the intake of blood is accurately controlled and the dog is in good clinical condition.

The evidence shows that a unit injury due to a unit of chloroform anæsthesia under fasting conditions will be repeated accurately again and again provided the dog is given sufficient time to repair each injury to normal. This gives much confidence in the interpretation of results and enables the author to draw finer distinctions as to the type and extent of the injury. In a review of the literature it will be noted that there is the greatest amount of variation in the recorded susceptibility of dogs to chloroform, but few if any figures are given to show the diet conditions which the author feels sure would explain the remarkable discrepancies.

In some instances unusual individual resistance or hypersusceptibility to chloroform poisoning was

recorded in the investigations reported, but such exceptions were rare and obtain in all physiologic or pharmacologic experiments. When a sufficient number of experiments are submitted, the law of reaction may be established and the few individual exceptions put aside for later consideration. It is truly astonishing to note the uniformity of the liver injury which follows a suitable unit period of chloroform injury to a dog after three or four days of fasting. Under such conditions the dog is the ideal subject for a study of chloroform injury and repair.

In this communication are given the results of feeding experiments which are corroboratory of Opie's work on rats and bring out a few new and interesting points.

Most of the experimental animals were young dogs and pups but a few older, adult dogs and rats were also utilized. As a rule the feeding of special diets was continued from three to six days and the exact time was indicated in the individual protocols.

Data have accumulated in regard to numerous starvation controls, but to avoid repetition only a limited number of these records have been included in the tables. In most cases the food for the dogs was left in the cages. Pups ate special or limited diets more readily than older dogs. Fluids, such as cottonseed oil, sugar solution, beef-extract solution, etc., were given by stomach tube.

The author offers no adequate explanation of the protective or injurious effect of any diet in modifying the action of chloroform, but recalls that Graham correlated resistance with the glycogen content of the liver. This is an attractive theory and in some cases seems to hold true. Carbohydrate diets certainly build up liver glycogen; the storage can be readily seen in ordinary sections stained with hæmotoxylin and eosin. However, if Kuriyama's work is reliable, glycogen storage is very difficult and glycogen elimination very prompt when thyroid is given. On the other hand, the protective action of sugar or kidney is not changed by the addition of thyroid, and thyroid given alone previous to chloroform does not modify the picture of ordinary starvation plus the effect of chloroform.

The facts brought out by the experiments reported are summarized as follows:

Starved animals are very susceptible to liver injury from chloroform. A maximal injury is to be expected.

When sugar and diets rich in carbohydrates are fed in the days preceding chloroform anæsthesia, they have a marked protective action against liver injury.

Fat alone, or combinations of food containing fat in large proportion, induce a maximal susceptibility to liver injury comparable to that induced by starvation.

Skeletal muscle and heart muscle seem to have a slight protective action.

Beef extract is highly protective in proportion to its actual food value.

The parenchymatous organs, liver and kidney, exert a considerable amount of protection.

Brain, although rich in lipoid substances, is a protective food against chloroform injury, thus being very unlike fat mixtures.

Skim milk alone and commercial casein alone or in combination with cracker meal are highly protective diets.

Gelatin has but slight protective action itself, and when given in mixtures with sugar does not lessen the protective value of the latter.

Thyroid powder given alone or in combination with foods (sugar, fat, etc.) apparently does not modify the chloroform injury which is to be expected without such addition.

Glucose or cream given intravenously during chloroform anæsthesia does not modify the effect of the drug on a starved animal. In one instance in which casein digest (high in amino-acid content) was given by stomach tube a few minutes before chloroform anæsthesia, a slight protective action was noted.

No single theory so far advanced will explain this peculiar protective action of certain food substances against the liver injury of chloroform anæsthesia. It certainly is a reaction of the liver-cells, not of substances circulating in the blood.

These facts should not be lost sight of in the management of cases in which the use of chloroform is indicated. The patient should be given liberal amounts of carbohydrates and milk for at least two days preceding the anæsthesia. It cannot be too often emphasized that it is dangerous to give chloroform to man or animals whenever a fasting period has preceded the administration of the anæsthetic.

G. E. Beilby.

Davis, N. C., and Whipple, G. H.: The Influence of Drugs and Chemical Agents on the Liver Necrosis of Chloroform Anæsthesia. *Arch. Int. Med.*, 1919, xxiii, 636.

Among the various explanations offered for the well-known liver injury from chloroform, Graham's theory is perhaps the most attractive. Graham believes that in the presence of water and oxygen in the body, chloroform is split and hydrochloric acid and carbon dioxide are formed. The hydrochloric acid then kills a certain amount of liver parenchyma, either by direct action or secondary asphyxia.

The authors admit that they are unable to follow the chemical reactions as outlined by Graham. They state, furthermore, that it is just as difficult to explain chloroform necrosis as to explain why chloroform passes by all of the body tissues until it reaches the liver, where the hypothetical chemical reaction takes place with the release of hydrochloric acid. The specific susceptibility of the liver-cell to chloroform is the riddle which has so far defied solution.

Graham produced liver necrosis in dogs by injecting hydrochloric acid into the portal vein, but the necrosis differed from typical chloroform injury in being portal (peripheral) rather than central. Hydrochloric acid given by the stomach tube to rabbits generally proved fatal. At necropsy the animals were found to have fatty livers and hæmorrhages in the stomach and duodenum. The areas of central necrosis in chloroform poisoning gave an acid test with the neutral red and a chlorine test with silver nitrate and sunlight.

The authors have attempted to repeat Graham's observations on the protective action of sodium carbonate given intravenously during chloroform anæthesia. The anæsthetic was administered at first over a period of four and one-half hours. They have found, however, that the liver injury was much more uniform after preliminary starvation which renders the animals more susceptible to injury and that therefore a shorter period of anæsthesia is sufficient to cause it. Their usual procedure then was to give one and one-half hours of chloroform anæsthesia (by the drop method with personal attention) to dogs which had fasted three days, and one and one-quarter hours of anæsthesia to those which had been fasting four days.

The experiments reported in this paper naturally fall into three groups. The first group contains those designed to repeat Graham's work on the protective action of carbonate solution against chloroform injury. Under carefully controlled conditions, the authors were not able to corroborate Graham's findings.

The second set of experiments was undertaken with the hope of sparing or diminishing the liver glycogen by means of drugs, and to see whether such reactions affected the subsequent injury of the liver by the chloroform. In these the evidence was more or less contradictory. The epinephrin and quinine treatments fulfilled the requirements for which they were chosen in that the injury was lessened, but whether or not this effect was the result of increased liver glycogen was not determined. Strychnine, supposed to decrease the glycogen content, did not cause any marked increase in the chloroform injury. Hydrazine sulphate, also known to lessen the glycogen content of the liver, caused an increase in fatty degeneration, but appeared to lessen the necrosis. The status of liver glycogen in relation to injury of the liver by chloroform is therefore not settled by the results of these investigations.

The third group of experiments was designed to obtain evidence concerning the relation of bodily oxidations to the necrosis of the liver due to chloroform. It would appear that large doses of "toxic proteose" intensify the injury while small doses have no effect. Potassium cyanide has a very prostrating immediate effect, but seems to have very little influence on delayed liver injury and necrosis. The results of these experiments are hard to reconcile with a theory of chloroform necrosis due to lower oxidation.

Although chloroform is losing favor as an anæsthetic, some physicians still employ it extensively. In view of the frequent therapeutic administration of such drugs as epinephrin and quinine, it may be well to call attention to a possible new use for them. In cases of pernicious vomiting, for example, it would be very dangerous to use chloroform because of the starvation of the tissues, but it might be possible to lessen the probable liver injury by means of these drugs.

The authors summarize their conclusions as follows:

Sodium carbonate in hypertonic salt solution given intravenously during chloroform anæsthesia has no protective action against the liver injury resulting from the chloroform.

Phosphate solutions, high in buffer content, have no protective action against chloroform liver injury.

Epinephrin given subcutaneously or intramuscularly in the days preceding chloroform anæsthesia exerts a distinct protective action against the injury of the liver by the chloroform. Some time is required for the development of the resistance and it is not demonstrable after a single dose of epinephrin given a short time before the administration of the chloroform.

Quinine sulphate given in the days preceding chloroform anæsthesia exerts a marked protective action against liver injury.

Hydrazine sulphate, although itself injurious to the liver, apparently does not intensify, and perhaps lessens, the toxic action of chloroform.

It would appear that strychnine sulphate has very little deleterious action on an ordinary chloroform injury following starvation.

Toxic proteose solutions in large dosage may intensify the chloroform injury, but in small amounts seem to have no effect.

Potassium cyanide given intravenously during chloroform anæsthesia, although very toxic at the time, seems to exert little if any influence on the delayed chloroform poisoning (liver injury.)

The hypothesis that glycogen protects the liver-cells against the injury of chloroform will not explain all the observed facts. Some of the experiments were in harmony with this hypothesis, but others were equally positive against it. This simple explanation of the resistance of liver-cells to chloroform injury does not suffice, and undoubtedly other factors are concerned which must be searched out.

The hypothesis that chloroform injury and liver necrosis are to be explained by a lowering of the level of tissue oxidation (tissue asphyxia) receives no support from our experiments.

The peculiar protective action of epinephrin and quinine sulphate in chloroform poisoning may have some practical clinical application.

G. E. Beilby.

Rood, F., Lockhart-Mummery, J. P., Cole, P. P., Shipway, F. E., and Blomfield: Discussion on the Present Position of Spinal Anæsthesia. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Anæs., 1.

Rood has always used stovaine except in about 250 cases in which novocaine was employed. After this trial of the latter he concluded that although novocaine produces perfect anæsthesia, it does not cause a muscular relaxation equal to that due to stovaine.

A 5 per cent solution of stovaine the density of which was increased by the addition of 5 per cent of dextrose was used in most cases. As this solution is heavier than the cerebrospinal fluid, the region and extent of the anæsthesia obtained can be regulated by the position of the patient during the injection. Although the stovaine-dextrose solution is diffusible, its movements are controlled by gravity for a few minutes after injection.

In a few hundred cases a solution of stovaine in saline was employed. It was found that, irrespective of the position of the patient, the stovaine diffused about 10 inches upward from the point of the injection and equally on both sides of the body. It was possible to limit its action or to increase it beyond this point only by increasing the dose and this had little effect. The anæsthesia produced by the saline solution was found to be more transient than that due to the denser solution and it was generally necessary to employ almost double the dose of stovaine to produce equally long anæsthesia.

When spinal anæsthesia was first used the great merit claimed for it was that it did away with the necessity for a general anæsthetic. Rood believes, however, that this is its great disadvantage. The fact that the patient is conscious—is present at his own operation—outweighs many of the advantages of spinal anæsthesia, and nowadays it is rarely employed without either some modification of "twilight-sleep" or a little general anæsthesia. In his opinion, also, a long operation in the Trendelenburg position or an operation on the rectum such as a combined abdominal-perineal operation, are ordeals which very few patients could stand while conscious even if it were to their advantage to do so. For severe operations the method he has employed has been to produce anæsthesia with ether, then inject the stovaine, discontinue the ether for a time, and finally give sufficient ether to keep the patient unconscious. For operations of a less severe type, scopolamine and morphine are administered about an hour before.

The safety of spinal anæsthesia as compared with that of other methods of producing anæsthesia is relative rather than absolute. There were 2 deaths in 8,000 cases. The postmortem examination in a case of intestinal obstruction showed the respiratory passages filled with vomited matter. The second death was that of a child 4 years of age who was suffering from gangrenous intussusception which Rood believed was due to a fall in blood-pressure caused by the stovaine added to the shock already present. Other complications during the course of the anæsthesia have resulted from: (1) interference with the respiration due to the fact that the stovaine reached too high a level; (2) complications arising from a fall in the general blood-pressure, syncope, etc.; and (3) vomiting.

Headache, vomiting, and pulmonary complications occasionally follow the administration of stovaine. Headache, which was sometimes severe, was more common when the patients were conscious during the operation. Acute septic conditions, such as appendicitis and osteomyelitis, were generally present in cases in which pneumonia developed. Occasionally pulmonary complications followed operations upon the upper abdomen.

The after-effects which have been reported may be due to some error of technique. Permanent palsies were more frequent when the puncture was made very low down, i. e., between the third and fourth lumbar vertebræ. Rood generally makes the injection between the eleventh and twelfth dorsal vertebræ.

The impression that spinal anæsthesia is a substitute when the patient is too ill to stand a general anæsthetic has been responsible for many of the reported failures. It is difficult to generalize as to the value of spinal anæsthesia in heart disease. In mitral disease with pulmonary congestion it is sometimes very useful, but certainly never in aortic disease nor in any other cardiac or vascular condition in which the patient is prone to attacks of syncope.

In the discussion following the reading of the article Cole stated that he first employed the glucose solution but discarded it in favor of a solution of sodium chloride the use of which allows the patient to be placed in the Trendelenburg position at once. When this is not necessary the feet should always be kept higher than the head both during and after the operation. The posture recommended does much to abolish the effects of diminished blood-pressure. In Cole's experience sodium chloride solution guarantees as lasting an anæsthesia as glucose solution.

Shipway was of the opinion that diffusion plays a very small part in producing serious symptoms. Faintness, pallor, vomiting, and collapse are all due to the decided fall of blood-pressure which results from the impairment of thoracic breathing and the paralysis of abdominal and skeletal muscles. The tone of the abdominal muscles of the trunk below the diaphragm and of the muscles of the lower limbs plays a very large part in maintaining blood-pressure. It is known that blood-pressure may fall as much as 50 millimeters in about ten minutes after injection. Such a marked fall is often dangerous.

The two important features brought out by Rood are, first, the possibility of using spinal anæsthesia with patients in the Trendelenburg position, and

second, the advantage of combining spinal with general anæsthesia. Concerning the latter he thinks that both Crile and Mummery underrate the power of inhalation anæsthesia to prevent shock. Everyday experience shows us that shock from operative procedures is effectively prevented by proper inhalation anæsthesia and the physiologists themselves have shown how difficult it is to produce shock in an etherized animal unless the abdomen is open and the viscera forcibly manipulated.

I. C. HERB.

SURGICAL INSTRUMENTS AND APPARATUS

Churchman, J. W.: Use of Continued Extension by Means of a New Extension Frame in the Bloodless Reduction of Congenital Dislocation of the Hip. *Surg., Gynec. & Obst.*, 1919, xxviii, 518.

The object of the modification of the Lorenz technique suggested by the author is to eliminate the risk of the latter while adhering to its principles by substituting for the violent manipulations under anæsthesia a rather gradual extension.

To this end, a new extension frame has been devised to put extension on the leg in any desired position of abduction and at the same time keep up any desired type of rotation.

With the frame described the muscles may be stretched gradually to any desired degree absolutely without pain, and the head of the femur gradually laid into position entirely by extension and rotation or by these methods supplemented by the slightest possible manipulation.

After the reduction of the dislocation, the case is treated exactly as advocated by Lorenz.

The extension frame consists of a 1¼ inch gas pipe bent into a circle. If abduction beyond a right angle is desired, or it is found that with abduction at nearly a right angle the child overcomes the abduction by rising in bed, the extension frame is shifted to the head of the bed in which position it is possible to obtain any desired degree of abduction. For rotation, straps are attached in the usual fashion and led to pulleys which can be fastened at any point of the frame.

The method described briefly is as follows:

1. Application of extension in the lines of the legs as they rest in their deformed position.
2. Gradual abduction until the legs form with each other an angle of 180 degrees.
3. When the maximum abduction has been produced, digital manipulation of the heads of the femurs to drop them into place.
4. Maintenance throughout of the degree of rotation necessary to keep the toes pointing directly upward.
5. Gradual reduction of the maximum abduction produced until the legs form with each other an angle of about 35 degrees.
6. Application of a plaster cast from the waist to the knees.
7. Transmission of the body weight to the acetabula through the heads of the femurs by allowing the child to walk.

If a favorable case in a young infant with well-developed acetabula is treated in this way, it will be found, not only that the treatment will be simplified by the elimination of the violent manipulations used heretofore, but also that more accurate results will be obtained. The head of the femur can be placed at will exactly where desired, and if roentgenographs show that the position is not entirely satisfactory, the necessary correction can be made by changing the direction of the extension or rotation straps. L. C. DONNELLY.

Lee, J. R.: Compound Fracture of the Femur in its Upper Third, with Demonstration of a New Pelvic-Femur Splint; Also a Splint for Fractures of the Upper Extremity. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Surg., 6.

The method of fixation of the fractured femur here described is based upon an appliance for the control of the smaller upper fragment which is flexed and abducted by the iliopsoas and glueal muscles. It has always been taught that in fractures of the upper third of the femur the upper fragment, which is short, cannot be controlled and therefore attempts have been made to procure alignment by abducting the lower fragment. This method is wrong in principle for the strong adductor magnus strongly adducts the lower fragment, and the distance from the symphysis to the adductor tubercle is 2 inches or more greater in the abducted position of the thigh.

The new pelvic-femur splint consists of a grip with two pads which fit any pelvis comfortably and securely, and grasp the pelvis and upper part of the femur firmly on both sides. By means of a fly nut on a screw the required amount of pressure is regulated to bring the small abducted upper fragment down and hold it in place. Both limbs are put up in modified Thomas frames which are hinged onto the pelvic grip. If much extension is found necessary, an adjustable piece can be fitted from the pelvic pad to the axilla on each side; in this way the upward thrust of the extending force will be partly taken by the axillæ and trunk and the pelvic caliper grip will not be displaced. A wooden splint to the back of the lower fragment may be needed also to correct backward displacement. All manipulations should be done on an X-ray couch and if necessary under an anæsthetic, so as to see that the two ends are approximated and in actual alignment. With this appliance the patient can be readily moved and nursing is facilitated. The appliance is of value also in treating a fractured pelvis.

The arm splint described consists of two parts, one fitted to the trunk and the other to the fractured arm. The upright trunk part is fitted to the hip with an adjustable piece which allows its upper forked end to be securely fitted into the axilla and

is fastened around the body by two straps. The part of the splint which carries the limb is attached to the upper forked end of the trunk portion by joints so that the arm can be supported at any desired angle. The splint can be used for either the right or left side by reversing the hip portion which is attached by an adjustable screw. With this appliance the splint carries the arm rather than the reverse and the fracture can be kept at rest and in comfort. P. W. SWEET.

SURGERY OF THE HEAD AND NECK

HEAD

Carter, W. W.: Bone Transplantation, the Ideal Method for the Correction of Saddle-Back Nose. *N. York M. J.*, 1919, cix, 899.

Carter believes that in the light of our present knowledge, the use of foreign material of any kind introduced into the tissues for the purpose of correcting nasal deformities is unwarranted, and so far as he knows, there is no material suited for this purpose except the autogenous bone transplant. He prefers the rib for transplantation purposes for the following reasons: it is quickly, easily, and safely removed, recovery is prompt, there is no loss of function resulting from its removal, and the small gap between the ends of the rib is quickly filled in with bone, ossification proceeding from the cut ends of the rib along the periosteum the inner layer of which is left when the rib is shelled out.

Usually he takes a section from the ninth rib. If it is necessary for the transplant to reach nearly to the tip, he takes the section at the juncture of the rib and the costal cartilage. The transplant is introduced from within the nose after a proper elevation of the tissues has been effected by the use of instruments especially designed for this purpose, its upper end being placed in close contact with the frontal bone. To prevent the slight depression which sometimes occurs on either side of the strip of bone, Carter has recently used the cancellous tissue and bone shavings to fill in the irregularities and round off the dorsum of the nose.

The success of the operation depends chiefly upon three factors: strict asepsis, an abundant supply of nourishment to the implanted bone, and immobilization of the part. E. C. ROBITSHEK.

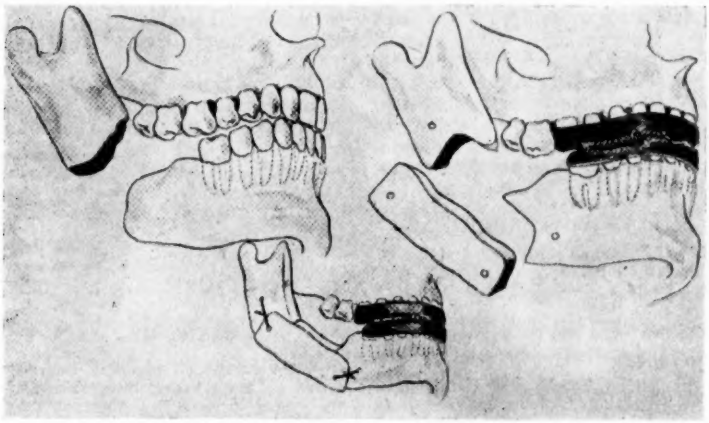
Waldron, C. W., and Risdon, E. F.: Mandibular Bone-Grafts. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Surg., 11,

In the early treatment of mandibular compound fractures with loss of bone substance, persistent efforts should be made to keep the mouth as clean as possible by frequent mouth washings and irrigation of pockets and sinuses. All sinuses should be freely drained and any attached comminuted fragments should not be disturbed until they become separated and remain as sequestra. Displaced fragments should be corrected and held by dental splints for two months or more. Teeth too near the line of fracture or those predisposing to infection of the wound should be extracted, but those which will be of service in immobilization of the parts when the graft is placed should be preserved. The date when all external and alveolar sinuses have definitely healed should be noted as no operative procedure should be undertaken until at least six months have elapsed after the complete disappearance of all inflammatory processes.

At least a week before the operation the dental splints should be cemented to the teeth in order that the mucous membrane of the mouth may become accustomed to them. The anæsthetic used is ether oil administered by rectum and ether administered intrapharyngeally through a nasal tube. After the field has been prepared with ether and iodine, a sterile dental rubber dam is fixed to the cheek and lower lip with adhesive. By turning this upward, the mouth is walled off and soiling by saliva is prevented. At the conclusion of the operation the rubber dam is turned down over the wound as a part of the dressing.

One type of graft is illustrated by the accompanying drawing. The incision is made so that it will be below, rather than over, the graft. The non-touch method is used. The ends of the fragments are exposed 1½ to 2 centimeters back and great care is taken not to perforate into the mouth cavity. The ends of the fragments are trimmed back until good, healthy, bleeding bone is reached. All cicatricial tissue should be excised. The rongeur forceps are used in preparing the graft and fragments. The ends of the fragments are squared off as well as possible, leaving a ledge above the graft which affords additional surface contact between the fragments and graft. When one end is well forward, an overlapping joint or a notching of the posterior fragment may be advantageous. The iliac crest is exposed and a piece of the proper size removed with small chisels and thin saws. Usually there is considerable free hæmorrhage which will require drainage of, and firm pressure to, the wound to control it. From this site, a shape suitable to the requirements of the case may be had with the minimum amount of modeling. Holes are drilled into the ends of the transplant and ends of the fragments, and short pieces of Belgian wire are threaded through and tightened. The subcutaneous tissues are closed with interrupted catgut and the skin closed with horsehair after all hæmorrhage is controlled.

On account of the wound of the iliac crest the patients are kept in bed for ten days. The diet is at first liquid, then semisolid. Splints are left on for



Left above: Non-union in region of angle. Control of posterior fragment most difficult.

Right above: Splint fixation of anterior fragment. Preparation of fragments for graft.

Below: Posterior fragment wedged backward by graft. (Waldon and Risdon: Mandibular Bone-Grafts)

from three to four months, and removed only when the progress, as shown by the X-ray, is satisfactory.

In reviewing the cases the author concludes: (1) that restoration of function may be expected in a large percentage of cases; (2) that both surgeon and dental surgeon must give careful attention to the case to the final stage; (3) that the iliac crest is best suited for grafts of mandibular fractures; and (4) that good contact of grafts to fresh healthy bone and the maintenance of the graft in position by wiring is essential. P. W. SWEET.

McCauley, D. H., and Worthley, D. L.: The Treatment of Ununited Fractures of the Jaws. Résumé of Work Done by the Dental Department, U. S. A. General Hospital No. 11, Cape May, N. J. *Dental Cosmos*, 1919, lxi, 391.

War surgery has presented problems and difficulties quite different from those met with in civil practice and of these the dental surgeon has had his full share, particularly in the treatment of fractures of the jaws due to gunshot wounds.

In civil life, fractures of the maxilla and mandible are seldom complicated by a loss of substance. In war injuries, however, such a loss is the rule rather than the exception.

In the cases reported the patients had received their wounds from six weeks to four months previous to the time treatment was begun. Only a few were not in good condition, in spite of the fact that there was a lack of proper materials for treatment. Splints had to be devised from 2-franc pieces, chicken wire, telephone wire, and any other malleable metal which could be obtained.

Immobilization for from three to four months was always necessary to secure union when there was a loss of substance. Such immobilization should be instituted with the muscles relaxed and the jaws in the position of rest. The danger of trismus following immobilization is very slight.

To force the jaws apart gradually the authors suggest the use of a simple tapered screw which can be adjusted by the patient himself. As the muscles seem to contract more at night during normal sleeping hours than at any other time, the patients were given a cork with a wire attached to place between the teeth before going to bed. Larger corks were substituted at regular intervals.

Food and fresh air are important factors in the successful treatment of any fracture. When the jaws have been immobilized, the food must, of course, be liquid or semi-liquid.

The authors report many interesting cases of fracture of the jaws which were treated successfully. M. N. FEDERSPIEL.

Ochsner, A. J.: Double Harelip and Cleft Palate. *Surg. Clin. Chicago*, 1919, iii, 257.

The first and probably the most important step in the operation for the repair of double harelip and cleft palate must consist in the adjustment of the intermandibular portion of the upper jaw to secure proper support for the lip which is to be constructed. To replace this portion of the jaw a triangular segment of the vomer which has pushed this portion forward should be cut away. The lateral edges should then be freshened as well as the ends of the alveolar processes on each side.

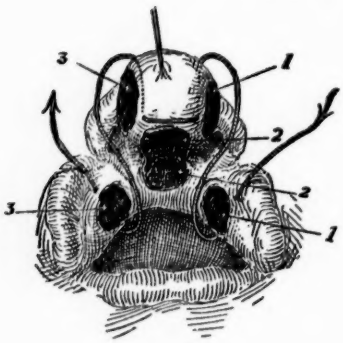


Fig. 1.

Fig. 1. Double congenital harelip and cleft palate. Appearance after intermandibular portion has been freed at 2-2 and elevated; the areas 1-1 and 3-3 are freshened and a silkworm-gut suture applied as shown.

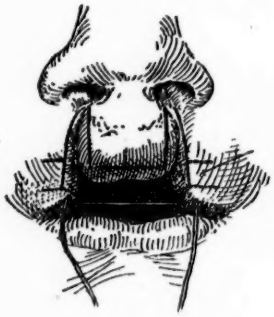


Fig. 2.

Fig. 2. Second stage of operation. The dotted lines are lines of incision; a suture has been passed through the mucocutaneous line of each side of the lip as a guide.

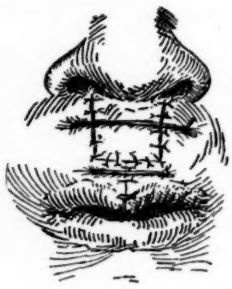


Fig. 3.

Fig. 3. Result at conclusion of operation.

After this, the intervening portion should be carefully sutured to make a continuous alveolar process. In doing this care must be taken not to interfere with the new teeth which are being formed.

Ochsner has found that fine silk, silkworm gut, or silver wire is best adapted as suture material for this purpose.

In the majority of these cases it is necessary to limit the amount of operating done at a single sitting. The child's strength is not always sufficient to warrant a continuation when the next procedure may involve a considerable loss of blood. Hence the second step may be postponed safely for one or two weeks.

In the closure of the harelip the central portion is utilized to secure a sufficient amount of tissue without undue tension. The mucous membrane is trimmed from it to form a rectangular flap and the edges of the lateral portions are trimmed so that the surfaces to be united are left entirely over the mucous membrane. To elevate the septum of the nose and at the same time increase the depth of the upper lip, a small lateral incision is made in the lateral flaps. The corners of the central flap can then be adjusted so that they fit into the angle formed after the lower portions of the lateral flaps have been drawn downward. A suture is next applied to the lateral projecting portion of the lip on each side, and by means of this portion the lip is lengthened and the lateral flaps are applied to the central part. All the surfaces are then sutured in place. The first silkworm-gut suture is passed through the lip and left untied. Then the mucous membrane is sutured posteriorly throughout with chronic catgut sutures, and finally the skin surfaces are closed with horsehair. The silkworm gut is tied loosely enough to prevent pressure necrosis and tightly enough to serve as a stay suture. The lateral flaps are supported by means of rubber adhesive strips 3 centimeters wide.

NECK

Sybenga, J. J.: Anterior Dislocation of the Atlas with a Break in the Continuity of the Anterior Arch. *J. Am. M. Ass.*, 1919, lxxii, 1450.

A soldier 24 years old was injured while making his escape from a German air raid and found unconscious by the roadside. When he revived he complained of severe headache and pain in the neck. On admission to the hospital the neck was found to be stiff and rotation was limited.

Except for a slightly more active right knee-jerk and slightly increased tone of the muscles of the right side, there were no changes. The stereoscopic X-ray examination seemed to reveal an anterior dislocation of the atlas and a break in the continuity of its anterior arch. The author points out, however, that the anterior arch sometimes develops two bone centers and the break in continuity seen in the X-ray might be due to lack of fusion of the centers instead of a pathologic condition.

A. Steindler.

Gault: The Treatment of Hæmorrhages from the Large Vessels of the Neck by the Endopharyngeal and External Routes Combined (Du traitement des hemorrhagies des gros vaisseaux du cou par voie endo-pharyngée et voie externe combinée). *Presse méd.*, Par., 1919, xxvii, 301.

Wounds of the large vessels of the neck are generally susceptible to pressure exerted on the carotid tubercle followed by the classical ligatures. When such wounds are very high, especially endopharyngeal, the usual ligatures are extremely difficult to apply or impracticable.

From several cases the author concludes:

1. In endopharyngeal wounds of the large vessels of the neck, immediate endopharyngeal pressure under endoscopic control if possible is efficacious. This pressure is made with the three middle fingers

of one hand, a compressive tampon closing the vessels on the transverse apophyses and controlling the hæmorrhage which if not checked would be rapidly fatal.

2. The tamponade described affords the time to make the necessary cervical ligatures and, if necessary, compression of the lateral sinus by the mastoid route.

3. A venous hæmorrhage can be thus overcome in almost all cases and an arterial hæmorrhage in many. In cases of wounds of the internal carotid which are situated very high, it has been shown by research on the cadaver that high endopharyngeal ligature of the vessel does not present very great difficulties from the operative point of view. On the living subject it is quite possible for a surgeon accustomed to endoscopic manœuvres to slip the compressing fingers along the vessel until the bleeding point is reached and clamp the vessel there with a forceps. A loop of thread is then slipped over the forceps and tied with the aid of two dissection forceps.

W. A. Brennan.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Davis, B. F.: Winged Scapula—Serratus Magnus Palsy. *Surg. Clin. Chicago*, 1919, iii, 391.

The author reports two cases of winged scapula, the first in a girl of 19, who gave the history of having fallen down a flight of stairs, striking on her right shoulder. The soreness disappeared after a couple of weeks but she was unable to raise the arm from the side beyond an angle of about 45 degrees. There was no restriction to passive motion.

On examination, the scapula was found to flare out from the plane of the back at an angle of about 45 degrees and its inferior angle was rotated toward the midline. When the patient attempted to raise her arm, the scapula flared out from the back at approximately a right angle and the greater the effort made to extend the arm, the more pronounced this displacement became.

The second case was that of a man, 21 years of age, suffering from progressive muscular dystrophy.

Winged scapula is a condition in which the inferior angle of the scapula flares out from the body at approximately a right angle to the coronal plane when the arms are extended anteriorly or abducted. The condition is usually associated with inability to raise the arm on the affected side above, or even to, the level of the shoulder, although the patient may be able to throw it up above the head and maintain it there once the position is attained.

The immediate cause is paralysis which may involve only the upper digitations of the serratus magnus, may be limited to the serratus magnus, or associated with paralysis of other muscles. Its causes are:

1. Trauma to the long thoracic nerve by puncture or incised wounds, extensive dissections in the axilla, blows on the root of the neck, pressure incident to carrying heavy loads on the shoulder, pressure due to catching of the nerve between the coracoid process and the first rib in excessive forward rotation of the shoulder, or repeated or long-continued contraction of the scalenus medius.

2. Infectious or toxic neuritis of the long thoracic nerve, due to diphtheria, la grippe, rheumatism, or anterior poliomyelitis.

3. Hysteria. A few cases have been described in which it was suspected that the lesion was purely functional.

4. Systemic disease such as progressive muscular dystrophy, particularly of the juvenile type.

The diagnosis is made upon the history and the results of physical examination.

The prognosis depends primarily upon the etiology. Winged scapula occurring in progressive muscular dystrophy never disappears spontaneously. When due to section of the long thoracic nerve, it is usually permanent, though in 90 per cent of the cases functional use of the extremity is regained through vicarious activity of the muscles of the shoulder remaining after the loss of the serratus magnus. In winged scapula occurring from other causes there is almost always complete restoration of anatomical and functional integrity without special treatment, though occasionally severe contusions of the long thoracic nerve may result in permanent loss of function.

Since the majority of cases become cured spontaneously, there are left but two very small groups for which special treatment is desirable. The first of these groups includes cases in which the condition appears in progressive muscular dystrophy, and the second, cases in which it results from sectioning, rarely contusion, of the long thoracic nerve.

In the vast majority of instances the treatment should be expectant. For the operative treatment, a number of procedures have been proposed, such as neuroplasty, scapula fixation, and muscle transplantation.

Neuroplasty consists in anastomosing the distal end of the long thoracic nerve to the proximal end of the short subscapular nerve. This is to be done when anastomosis between the proximal and distal ends of the long thoracic nerve itself is found to be impossible.

Scapula fixation and muscle transplantation have not been particularly satisfactory. Various attempts have been made to fix the scapula by cutting off its inferior angle, freeing the subscapularis and infraspinatus muscles, and stitching them to the fascia of the back, but they have not resulted in an improvement of the patient's condition. The

author tried this method on his second case two years before this article was written, and while the patient states that he is no worse than he was before, he is no better.

The author's first patient was not operated upon because it was thought that a complete return of function would probably occur in a few months.

G. W. HOCHREIN.

Nixon, J. A.: Remarks on Chest Wounds. *Brit. M. J.*, 1919, i, 399.

In the early stages of chest wounds the physician's first work is to help the surgeon select cases which require and are fit for immediate operation and resuscitation.

Indications for immediate operation are: (1) hæmorrhage, (2) injuries of the diaphragm, (3) open pneumothorax, (4) "stove-in" chest, (5) retained missiles, bone, or clothing, and (6) early acute infection. The patient may be unfit for operation because of: (1) intrathoracic injuries, (2) the severity of external or complicating wounds, (3) loss of blood, and (4) collapse or shock due to cold and transport.

The physician must decide as to the intrathoracic injuries and form a definite opinion as to whether there is sufficient pneumothorax, hæmothorax, collapse of the lung, laceration or hæmatoma of the lung, or injury to the heart, pericardium, great vessels, diaphragm, vertebræ, or spinal cord to account for the severity of the symptoms.

The patient may be unfit for any immediate surgical procedure save one of the following: (1) immediate and rapid operation for the arrest of visible hæmorrhage from the chest wall or thorax; (2) the arrest of hæmorrhage from co-existing wounds; (3) aspiration for the relief of pneumothorax; (4) aspiration for the relief of hæmothorax; or (5) temporary closure of open pneumothorax.

Apart from one of these procedures nothing else remains than measures for resuscitation. As a rule, it is injudicious to aspirate immediately for pneumothorax or hæmo-thorax.

In order to decide whether or not a patient needs immediate operation, the extent of the thoracic injury must be estimated. If the patient is profoundly collapsed or in great respiratory distress on arrival at the casualty clearing station, the following possible causes should be considered:

Hæmorrhage: This may have been profuse and may still continue. With closed hæmothorax the amount of intrathoracic hæmorrhage is usually not enough by itself to produce severe shock. When there is an open thorax, the estimated size of the hæmothorax is not a guide to the quantity of blood lost.

Comminuted fractures of the ribs, scapula, or sternum: These produce the gravest symptoms even in the absence of severe intrathoracic trauma. It is of the utmost importance in such cases to determine the extent of the intrathoracic or pulmonary injury.

Injuries of other parts of the body: Careful attention has always to be paid to injuries other than purely thoracic injuries, such as those of the diaphragm and abdominal viscera. A prompt decision must be made as to whether or not there is sufficient thoracic injury to produce the symptoms, or whether the intrathoracic injury may be ignored and a further explanation looked for below the diaphragm. All spinal injuries demand recognition, not merely those which involve the spinal cord itself. Injuries to the vertebræ may cause the gravest symptoms. Profound collapse which resists all efforts at resuscitation is often observed in spinal injuries even when the cord is undamaged.

Open thorax: The distress caused by an open thorax is often very great, and until the opening has been closed it is difficult to estimate the extent to which the symptoms are due to injury to the thoracic contents. Auscultation and percussion add little information to what can be seen. Active hæmorrhage may be visible externally.

In cases of closed thorax the examination of the chest resolves itself into a combination of the ordinary physical methods with radioscopy and radiography.

The author takes up the methods of examining the chest by inspection, palpation, percussion, auscultation, etc., and goes into detail regarding the various signs of injury, their value in diagnosis, and how at times they may be misleading.

It is impossible to treat chest wounds adequately without the X-ray. The position of the heart and diaphragm and their movements, damage to the lung, collapse of the lung, hæmothorax, and pneumothorax, can be accurately determined only by the X-rays in conjunction with the physical signs. Radiography is insufficient; the patients must be examined also radioscopically, and the parts seen in movement with the fluoroscopic screen if possible while they are in the sitting position.

All wounds of the parietes and thoracic contents should receive the surgical attention they require at the earliest possible moment. Hæmorrhage must be arrested and every possible step taken early to avert infection. No fluid, whether blood, serum, or pus, must be allowed to collect in the chest. Fluid in the chest is dangerous for it is a nidus for sepsis and interferes with expansion. Foreign bodies—metal, clothing, and bone—should be removed whenever possible.

Resection and open drainage as formerly practiced for emphysema is an unsatisfactory operation and has been shown by the experience in this war to be rarely necessary if early treatment according to modern methods is not neglected. V. C. HUNT.

McGuire, W. A.: Hæmothorax Following Gunshot Wounds of the Chest. *J. Am. M. Ass.*, 1919, lxxii, 1269.

The death rate from chest wounds during previous wars was as follows: Civil war, 62 per cent; Crimean war, 90 per cent; Spanish-American war, 27 per

cent. Statistics for the recent war show wide variations. Some place the mortality rate as low as 10 per cent, others as high as 20 per cent. The author states that chest wounds comprised 2 per cent of all casualties; one-half of these were due to rifle and machine-gun bullets.

Of 300 men who died on the battle field, 112 had fatal chest wounds. In the casualty clearing stations and evacuation hospitals the mortality was 40 per cent, while in the base hospitals it was variously reported as 8 per cent, 4 per cent, and 27 per cent.

The anatomical causes of death according to their frequency were hæmorrhage, double pneumothorax, shock, œdema of the lung, and complicating injuries to other parts. Sepsis also was responsible for a number of deaths. According to Soltau, 48 per cent of deaths were due to gas-producing organisms, 40 per cent to streptococci, and 12 per cent to pulmonary organisms.

Fracture of the ribs was an infrequent complication. Unilateral pneumothorax occurred most often after injuries by shell fragments. The most common complication was hæmothorax which was found in 80 per cent of the cases of chest injury.

Both lung collapse and hæmorrhage may occur without perforation of the thorax, and an ordinary tangential wound may be responsible for both.

By questioning more than 50 patients with lung perforations to learn the immediate symptoms, the following information was obtained. When hit by a rifle or machine-gun bullet a light blow was felt in the chest or back. Those sustaining shrapnel injuries felt a heavy shock-like blow and were forcibly thrown to the ground. Pain was the first symptom noticed and was only moderately severe; it increased with each respiration and referred directly to the site of the wound. In 10 per cent of the cases the pain was referred to the shoulder, and in only one case, to the upper abdomen. Most of the patients were able to walk from 100 yards to 3 miles after the injury. Ten per cent experienced nausea and vomiting. Only one became unconscious, but all experienced faintness in varying degree. Dyspnœa was the most common symptom and was present not only in cases of penetrating chest wounds but also in cases of tangential wounds. Cyanosis was not a marked or constant symptom. Hæmoptysis occurred in 90 per cent of the cases and lasted not longer than four days.

The treatment these men received in a base hospital was as follows: in 22 of 25 cases there was a simple debridement of the wound of entrance and removal of the foreign body when it was accessible, and in 3 cases a radical operation in which the lung was exposed, the foreign body and the clot removed, and the wound closed in layers. Of the 3 latter patients, 2 developed infection necessitating subsequent rib resection and drainage.

Eleven of the sterile wounds were perforating wounds due to machine-gun bullets or tangential wounds. The patients had slight dyspnœa on exertion, but the physical and X-ray findings were negative or nearly so. In 11 other sterile cases there were varying degrees of hæmothorax. In these instances the symptoms consisted of: (1) dyspnœa, which depended upon the degree of lung collapse and the amount of fluid and appeared only on exertion; (2) slight cough and expectoration; (3) an average evening temperature for ten days of 99.4, regular and constant; (4) a moderately increased pulse rate; and (5) respirations ranging from 19 to 23.

On physical examination flatness which did not always shift when the patient's position was changed was found on percussion when the blood had clotted after varying periods. Auscultation gave conflicting and misleading information. The leucocyte count averaged 11,000, with 72 per cent polymorphonuclear leucocytes.

In infected cases the pain was very severe and there was marked dyspnœa even when the patient remained quiet. Cough and expectoration were moderate and usually occurred at night. The temperature ranged from 100 to 103, with irregular excursions. The pulse was rapid in all, and there were the usual signs of sepsis. The treatment of these patients consisted of rib resection and free drainage.

The author emphasized the fact that the fluoroscope had been an invaluable aid in the differential diagnosis and management. V. P. DIEDERICH.

Beck, E. G.: What Shall Be Done with the Open Chronic Suppurations of the Chest Cavity? *Med. Rec.*, 1919, xcv, 770.

Stereoscopic roentgenograms of the chest are of great value in determining the cause of chronic suppurations.

The author demonstrates by plates how the cavities are easily outlined by injecting into them bismuth-vaseline paste consisting of 10 parts of bismuth subnitrate to 90 parts of vaseline. The plates show also that changes of position give valuable information as to drainage, as the paste settles in the cavities. Bronchial communications are indicated when the paste is coughed up. Great care should be taken in these cases and the mixture used should be liquid.

In many cases of tuberculous origin no tubercle bacilli were found in the pus before the injection of the paste, but after its injection were discovered in large numbers.

For the location of foreign bodies in the chest, which are often the cause of these chronic suppurations, the author uses a stereo method he described in 1917.

At least four out of five of the very old cases may be cured by repeated injections of the paste continued for several months. In some instances the sinus remains closed for a year or two but finally reopens. The injections should then be repeated. The sinus will close again but may reopen after a period of a few years. In spite of these reopenings, however, the author believes this method

is best and the patient will consent to it rather than to the radical operation.

Cavities holding more than 200 grams and those with communicating bronchi are less likely to heal by this method. When the discharge continues to be purulent, more radical procedures are necessary. In the one case out of five in which there may be no tendency to heal by the method described the author uses his skin-sliding operation in preference to the Estlander or Schede operations. V. P. DIEDERICH.

Green, J. R.: The Physiology of Respiration in the Treatment of War Wounds of the Chest and Empyema. *J. Am. M. Ass.*, 1919, lxxii, 1356.

From evidence compiled from clinical observations in war wounds of the chest, the author makes the following generalizations:

1. Respiration is re-established in a collapsed lung only when the movements of the diaphragm are established as rhythmic contractions.

2. The lung in expanding forces itself into an large, open wound of the chest wall, not seldom and accidently, but very often. This occurs in the presence of full atmospheric pressure which opposes the protrusion and the root of the lung is pushed further laterally than normal from the open thorax wound.

3. The diaphragm is vital in the production of the respiratory reflex because wounds of the diaphragm if unrepaired always produce death, even though the muscle is situated so that its contraction makes an air-tight and water-tight valve which insures a perfect piston action. The cause must lie in a disruption of its co-ordinating mechanism similar to fibrillation in the heart muscle.

The conclusions from experimental work are:

1. The extent of lung expansion is in direct proportion to the amplitude of the contractions of the diaphragm.

2. Collapse of the lung is a defensive reflex to preserve the normal temperature of the blood.

3. The first expansile effort on the part of the lung when the thorax is opened is a natural effort to plug the thoracic opening.

4. Both expansion and collapse, as defensive reactions, are merely exaggerated uses of the normal lung reactions to meet conditions of changing temperature. The adaptation to higher temperatures under normal conditions is made by sighing and gasping; temperatures too low call for a lessening of the respiratory movements. E. B. FREILICH.

McDuffie, M. W.: Postinfluenzal Empyema. *N. York M. J.*, 1919, cix, 766.

On the basis of reports from various parts of the country in regard to influenza and pneumonia, McDuffie concludes that empyema in some form occurs in about 5 per cent of the cases and is nature's method of freeing the blood-stream of the invading organism.

He would divide cases of empyema into two distinct divisions, those with and those without bronchial connection. In the diagnosis the physical findings, the X-ray, and the aspiration needle are of the utmost importance. When the pus pocket is not in contact with the chest wall, the diagnosis is more difficult. Thoracic paracentesis is the most reliable diagnostic procedure, but may fail when the walls of the cavity are covered with a thick coat of fibrin, or when the pus itself is viscid. Subphrenic abscess, new growths, and serous effusions must be differentiated. Aspiration is best for infants under 2 years of age, the most desirable point of aspiration being the interspace between the ninth and tenth ribs, either in the axillary or the mid-scapular line.

As an anæsthetic for operation in empyema nitrogen gas and oxygen have given the most satisfaction. Procedures under local anæsthesia are warranted only in emergencies.

All methods of operating are greatly excelled by anterior incision which has the following advantages: first, freedom of approach; second, less difficulty in operating; third, the presence of a greater amount of periosteum; fourth, better control of drainage; and fifth, more satisfactory end-results to the patient. The steps of the operation cannot be stated more clearly than has already been done by Pierre Duval. The author, however, prefers making the incision at the ninth rather than the fourth rib. E. C. ROBITSCHEK.

Gray, H.: Pneumonia and Empyema. *Boston M. & S. J.*, 1919, clxxx, 475.

This article is a continuation of a series dealing with cases of pneumonia and empyema treated at the base hospital at Camp Devens, Mass. Of 485 cases of pneumonia cared for during a period of thirty-five weeks, 88 per cent were primary cases, 8 per cent were due to an attack of measles, and 4 per cent followed ether anæsthesia. The onset was abrupt in only one-third of the cases. Usually the diagnosis was not made until the fourth day. Of the total number of patients, 16 per cent developed empyema, a complication which raised the mortality from 13 per cent to 44 per cent. Fifty-three per cent of the cases of empyema were due to the hæmolytic streptococcus. More than half of the patients developed a transient nephritis.

The author suggests that a definite diagnosis might be made earlier by (1) careful observation of the temperature and respiration of all patients who have "common colds" or measles and who have taken ether, (2) daily inquiry as to chest pain, (3) careful daily examination of the chest, (4) an X-ray picture, and (5) early sputum examination in all suspected cases. The attention of medical officers should be called to the importance of suspecting all cases of pain in the chest or abdomen and referring them to the hospital for observation for pneumonia. The presence of effusions could be diagnosed earlier by a search for muffled breath

sounds, especially "rasping," signs of extending unilateral dullness, or evidence of prostration. Any one of these three is an adequate indication for exploratory aspiration. An essential part of the treatment during convalescence is graded military exercises continued for a considerable period of time.

E. M. MILLER.

Philips, H. B.: Empyema at Camp Mills, L. I., with Special Reference to the Use of the Philips Empyema Apparatus. *J. Am. M. Ass.*, 1919, lxxii, 1274.

The author reviews the results obtained with various methods at Camp Mills, L. I., in the treatment of empyema, and refers especially to those achieved with his apparatus.

Seventeen cases were treated with simple aspirations repeated at three- to seven-day intervals or as conditions indicated. Three patients were cured, two died, and the rest were later treated by one of the other methods. Simple aspiration very often caused pneumothorax.

Intercostal drainage was used in ten cases and in this group the mortality was 30 per cent. There were two complete cures after six weeks of treatment. The intercostal drainage was effected by the insertion of various improvised cannulas and tubes connected with suction bottles. No irrigations were used.

Rib resections were done in twelve cases. Seven of these patients had received repeated preliminary aspirations. One of them died. Of the eleven remaining, two have been cured and all others had been draining from nine to eleven weeks when the report was written. Of this series, those who had received the preliminary aspirations appeared to stand the rib resection better than the others.

The Philips apparatus was used in sixteen cases. Five patients died while still suffering from pneumonia. In two cases closure was effected in ten and twenty days, respectively, but reopening was necessary. Two cases were cured in ten and twenty-one days respectively.

V. P. DIEDERICH.

TRACHEA AND LUNGS

Brau-Taple: Eleven Cases of Pulmonary Suture in War Wounds of the Lung (Sur onze cas de sutures pulmonaires pour plaies de guerre du poumon). *J. de méd. de Bordeaux*, 1919, xc, 50.

In 63 cases of thoracic perforations due to war projectiles an operation to extract the projectile and cure the lung lesions produced by it radically was indicated in 11. Six of these patients recovered. In 5 cases the wounds healed by first intention. There were 5 deaths, 1 due to hæmorrhagic shock, 1 to liver toxæmia, 1 to purulent pleurisy, and 2 to acute septicæmia. The majority of these patients were hæmorrhagic and some of them in a bad condition of shock. Transfusion was resorted to in only 1 case and gave negative results.

The operation consisted of a preliminary thoracotomy, the third or fourth rib being resected for a distance of about 5 centimeters. In several of the cases, however, the suture of the torn lung was done through the orifice created by the projectile. After the suture of the lung and the evacuation of blood and clots from the pleural cavity, the anæsthesia was momentarily suspended and the cavity washed out with ether. The character of the pulse and respiration was not affected by this. The clinical histories of the 11 cases are given in detail and illustrated.

The conclusions drawn by the author on the basis of his results were:

1. Under favorable circumstances operation is indicated principally when (1) the pulmonary hæmorrhage continues, and (2) the embedded projectile is as large as, or larger than, a nut.

2. A prior thoracotomy is necessary whenever there is doubt as to the practicability of reaching the pulmonary wound or the projectile by the orifice of entry of the projectile and surgical intervention should be always complete.

3. Every aid afforded by the laboratory should be utilized whenever possible.

4. A hæmothorax after operation should be punctured on the fourth or fifth day.

W. A. BRENNAN.

Fullerton, A.: Missiles as Emboli. *Lancet*, 1919 cxcvi, 913.

The patient, a soldier, had been hit with a rifle or machine-gun bullet a few hours before he was admitted to the clearing station. Immediately after the injury he complained of difficulty in breathing. On admission to the station he was somewhat cyanosed and dyspnœic, and his pulse was small and rapid. He was not cold or blanched. The wound of entrance of the bullet was situated in the left loin 2 inches from the spinous processes, at the level of the highest point of the iliac crest. Examination with the X-ray showed that the missile was retained 4 inches below a pencil mark on the skin over the anterior surface of the chest wall, at the level of the juncture of the second costal cartilage with the sternum and three fingers' breadth to the right of the sternal border. Death occurred eleven and one-half hours after the receipt of the injury.

A postmortem examination was performed the same day. The track of the bullet showed that the latter had passed through the transverse mesocolon, the stomach, the left lobe of the liver, the diaphragm, the posterior surface of the right ventricle (small puncture), and one of the cusps of the auriculoventricular valve, and had entered the upper main branch of the right pulmonary artery where it had been arrested. Blood (about 8 ounces) was found in the pericardial sac, and extravasated stomach contents in the peritoneal cavity. The right lung was collapsed although it was not involved by the wound.

HEART AND VASCULAR SYSTEM

Butler, E. F.: Stab Wound of Heart: Suture of Heart Muscle with Recovery. *J. Am. M. Ass.*, 1919, lxxii, 1283.

The author reports the case of a man 42 years of age who was brought to him suffering with a stab-wound of the heart which had been inflicted with a butcher knife.

Following his injury, the patient had been able to walk across the street. When he reached the hospital a short time later he had marked dyspnœa which was increased on lying down, pain in the precordial region which was increased by respiratory movements, and a pulse of 80 which was regular and of low volume and tension. Over the costal cartilage of the fifth rib on the left side and 6 cms. from the midline was a wound 2 cms. long.

Four and one-half hours after the accident, the wound was excised and the skin margins resected with the patient under local anæsthesia. A general anæsthetic was then given, and 12 cms. of the fifth rib which had been severed were resected. The left pleural cavity was opened and found to contain about 100 cc. of blood.. No injury of the collapsed lung could be seen. The wound in the pericardium, which was 1 cm. long, was made 4 cms. long. In the pericardial cavity was a slight amount of clotted blood. In the left ventricle was a wound 1 cm. long, but not penetrating the cavity. It bled rather profusely and in spurts synchronous with the heart beat.

The wound in the heart muscle was closed with two catgut sutures and the chest wall closed in layers with a drain to the pectoral muscles. Four days later the patient's pulse and temperature were normal. V. P. DIEDERICH.

Delorme, E.: The Operative Technique of Cardiolysis (Technique opératoire de la cardiolyse). *Lanc. franc.: Gaz. d. hôp.*, 1919, xcii, 357.

By "cardiolysis" Delorme means the destruction of cardiopericardiac adhesions. This term therefore should not be confused with "pericardiolysis," which is the destruction of the thoracic wall in the cardiac area. In Delorme's opinion, cardiolysis has earned a place in surgical therapeutics.

After a chondrocostal exploration the author makes an incision from the fourth to the sixth rib. A grooved sound or the finger is then pushed behind the deep surface of the sternum to separate the external surface of the pericardium from the pleural culs-de-sac. The pericardium is incised for the whole length of the operative wound and the cardiolysis effected with the fingers and the end of a curved scissors. If in sectioning the pericardiac adhesions an excessive resistance is met with, especially in the non-accessible parts, it is best to stop. If the adhesions are too intimate to permit separation, the intervention should be limited to freeing the pericardium from its anterior diaphragmatic attachments.

Cardiolysis is indicated in cardiac symphysis of rheumatismal origin with dilatation and hypertrophy, and in tuberculous symphyses.

As the destruction of cardiopericardiac adhesions is much more easily accomplished soon after the adhesions are formed, the operation should be done as early as circumstances permit. It should be remembered that the thinness of the heart muscle precludes any action upon it if the adhesions are not new and loose.

Recent advances in radioscopy have transformed the diagnosis of both total and partial cardiac symphyses, and the late war, owing to the many operations for the removal of intracardiac projectiles, has established many valuable clinical findings. The apprehension with which surgeons formerly approached cardiopericardiac interventions has been removed to a great extent by recent advances. If the nature and the degree of the trouble in the circulatory system due to the presence of pericardial adhesions can be definitely determined and are of sufficient importance, there appears to be no reason why a prudently conducted operation should not be undertaken. W. A. BRENNAN.

PHARYNX AND ŒSOPHAGUS

Kelly, A. B.: Discussion on Dilatation of the Œsophagus without Anatomical Stenosis. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Laryngol., 48.

In his discussion on dilatation of the œsophagus Kelly states that the preliminary part of the treatment of cardiospasm is carried out by the aid of direct inspection. The technique he uses and the observations that he considers of most importance are briefly as follows:

1. For the first examination a general anæsthetic is used. Otherwise the strain might aggravate the disease.

2. In introducing the tube more resistance than usual is encountered near the mouth of the gullet. This observation and the fact that the patients often refer their dysphagia to the cricoid region indicate that obstruction at the cardia may be associated with spasm at the upper end.

3. The patient lies on his back with his head slightly lowered as this is the best position for the examination of the cardiac end and aids drainage which begins as soon as the tube enters the gullet.

4. After the gullet is thoroughly cleaned, the hiatal and subhiatal regions are examined. The first point to be noted is the distance of the hiatal gullet from the upper teeth. The average distance in males is 40 cm., and in females, 39 cm.

In most of the author's cases the lumen of the hiatal portion was surrounded by a stellate arrangement of folds of mucous membrane; in others it was V-shaped or merely a slit with a prominent cushion in front and behind. The size of the lumen was constantly changing on inspiration and expiration. This appearance and movement were observed with the end of the tube 3 centimeters above the

hiatal level and are given as normal. As soon as the tube was introduced so that it came into contact with the parts around the hiatus, however, the lumen was at once closed and remained closed until the tube was withdrawn a few centimeters when the opening and closing began again.

This observation was made repeatedly and was proved to be peculiar to patients suffering from cardiospasm. According to the experiments reported, such patients have a considerable area of hyperæsthesia in the gullet and it is to this that the cardiospasm is due, The etiology of the hyperæsthesia is unknown.

After a consideration of the different remedial agents for the relief of cardiospasm, the author gives in detail his method of using Gottstein's instrument which affords relief in all cases and effects a cure in many. J. J. HOMPES.

Worthington, R.: Dilatation of the Œsophagus without Stenosis. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Laryngol., 95.

Worthington reports the case of a woman 34 years of age who had suffered from difficulty in swallowing for two years. During that time she had lived almost entirely on milk, but occasionally was able to swallow more solid food.

Examination of the œsophagus showed that it was dilated and contained milk curds and a partially macerated piece of meat about 1 inch long which appeared to have been lodged there for some time.

After the œsophagus was emptied, the author was surprised to find that a large-sized bougie could be passed into the stomach with ease.

The following day the patient's ability to swallow was much improved and she declined further treatment.

A report received from her later, however, stated that she speedily relapsed into her previous condition. Occasionally she has crises lasting for several days when she is unable to swallow anything at all, and during the intervals she lives entirely on milk.

This case disproves the contention put forward a few years ago that there is no such condition as spasmodic stricture of the œsophagus.

J. J. HOMPES.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Trick, H. R.: Dynamics of Abdominal Herniæ. *N. York J. Med.*, 1919, xix, 166.

No operation yet designed is proof against recurrence, and because of the inherent mechanical faults of our anatomy rather than faulty technique, it is not likely that any operation will be developed that will guarantee 100 per cent of cures.

The generally recognized causes of abdominal herniæ are: (1) contributing causes, such as developmental defects, ascites, tympanites, abdominal tumors, etc., and (2) active or exciting causes, such as coughing, sneezing, violent exercise, etc.

Intra-abdominal pressure is the mechanical equilibrium between the abdominal wall and the organs it encompasses, that is, static or potential energy. In increased intra-abdominal pressure there is a loss of this equilibrium. Since normally there is no air or fluid in the abdominal cavity, the term "increased intravisceral pressure" would seem to describe the situation more literally.

Tympanites from an obstruction of the bowel increases the intra-abdominal pressure, but does not cause a hernia as a distended bowel does not adapt itself to the slits through which it must pass in order to become a hernia. Neither is an absolutely collapsed bowel likely to produce a hernia. Ascites may develop a sac but does not make a hernia unless some organ is forced into the sac. Most apt to produce an abdominal hernia it would seem would be a condition midway between distension and collapse of the bowel.

The author suggests the manner in which a hernia may be formed. When a loop of flaccid bowel located opposite the internal or femoral ring or some other weak spot is suddenly exposed to concentric compression by the violent contraction of all the abdominal muscles, a diverticulum of the bowel is forced through the weak spot and its size increased with each repetition of the condition. This theory applies equally well to all varieties of abdominal hernia. The sac, which is the only part of a hernia that may be congenital, may have been developed by the application of the same forces in intra-uterine life. The proper treatment of hernia, therefore, becomes a matter of applied mechanics.

The author discourages the use of the truss except when surgical treatment is contra-indicated. For the radical cure he advises operation in which the repair of the transversalis fascia is of great importance. V. C. HUNT.

GASTRO-INTESTINAL TRACT

Razzaboni, G.: Subtotal Gastrectomy for Pseudoneoplastic Gastric Tuberculosis (Gastrectomia subtotale per tuberculosi gastrica a forma pseudoneoplastica). *Policlin.*, Roma, 1919, xxvi, sez. chir., 153.

The case reported was that of a woman aged 60 years. The condition was diagnosed as gastric carcinoma and a laparotomy was performed. The greater part of the stomach wall except the region of the cardia was found to be involved by a diffuse tumorous mass. This mass and the omental

adhesions were removed en bloc by the Billroth II method with gastro-intestinal anastomosis.

Subsequent examination of the resected mass showed the lesions to be inflammatory and not neoplastic. While the histological data were not sufficient in themselves to establish its exact nature clearly, there was lymphoid infiltration and the presence of giant cells. The Koch bacillus could not be isolated from the specimens directly but animal inoculation gave positive results for tuberculosis.

The characteristics of the lesions were the same as those described by Poncet and Leriche as inflammatory tuberculosis.

The diagnosis of gastric tuberculosis is always very difficult and usually is established only by examination of an excised specimen. The patient in this case gave no history of the disease.

W. A. BRENNAN

Urrutia, L.: The Surgical Treatment of Gastric Ulcer and Its Complications (Tratamiento quirúrgico de la ulcera gástrica y sus complicaciones). Monograph, San Sebastián, 1919.

Urrutia reports 219 cases of ulcer (128 gastric; 88 duodenal; 1 gastrojejunal; and 1 jejunal) operated upon at San Sabastian from September, 1914, to March, 1919. There were 15 operative deaths, a total mortality of 6.8 per cent.

The monograph gives a historical review of the surgical treatment of gastric and duodenal ulcers and a criticism of the different techniques.

Urrutia's conclusions are:

1. A simple gastro-enterostomy alone is indicated in purely cicatricial pyloric stenoses. When there is also an active ulcer, as in the majority of cases, a pylorectomy ought be performed.

2. In gastric ulcers situated anywhere except in the cardia an extensive pylorogastrectomy should be performed and followed by a rectocolic gastro-enterostomy or an end-to-side gastrojejunostomy. In exceptional cases, however, an annular resection followed by end-to-end anastomosis will be necessary.

3. In cases of duodenal ulcers which cannot be excised, gastro-enterostomy should be combined with resection of the pyloric antrum, unilateral exclusion or sphincterectomy being reserved for special cases.

4. With correct technique, the mortality following these operations should not be higher than that of simple gastro-enterostomy and the ultimate results should be much better.

5. The method of choice in mediogastric stenoses is annular or pylorogastric resection.

6. In acute perforations an immediate operation will save life in the majority of cases.

7. In subacute or covered perforations operation is called for in every case.

8. In profuse hæmorrhages due to gastric or duodenal ulcers the results of medical treatment are much superior to those obtained by surgery. An operation should be performed in such cases only in quiescent periods or when there is chronic hæmorrhage.

W. A. BRENNAN.

Wall, J. S.: Pyloric Stenosis of Infancy. *Arch Pedial.*, 1919, xxxvi, 193.

The author deals only with the hypertrophic variety of pyloric stenosis. In discussing the etiology of the condition he states that from the standpoint of embryology it is possible that the stenosis is due to a temporary obturation of the lumen of the duodenum which is apparently a normal stage of evolution in the fœtus from 12 to 15 millimeters long. Whether or not, however, the persistence of such an intestinal block would lead to hypertrophy of the adjacent sphincter is within the realm of speculation. Downes believes there is an abnormal thickening at birth, and the effort necessary to force food through the narrowed pyloric lumen produces circulatory disturbances which result in œdema. Many believe that the condition is associated with enlargement of the thymus gland, but sufficient observation has not been made to confirm this opinion.

Pyloric stenosis is a disease of serious import and failure to recognize it is almost inexcusable. The symptoms are: (1) vomiting of the projectile type in large quantities which begins usually between the second and fifth weeks, rarely earlier or later, and as a rule occurs after each nursing though often several feedings are retained during the day and all are vomited at once; (2) a loss of weight amounting to 3 or 4 ounces a day, and later, as much as half a pound; (3) stools which at first are dark brown but later become tarry and resemble meconium; (4) scantiness of urine; and (5) dryness of the skin.

The chief physical characteristics are as follows: (1) peristaltic waves which appear as spherical gas balls or miniature balloons under the left border of the ribs and pass slowly toward the right, usually above the line of the umbilicus, and (2) possibly a pyloric tumor which, if present, is usually of great importance and can be palpated as a movable body the size of a small olive, 1 inch or more to the right of the umbilicus. The degree of emaciation depends entirely upon the stage of the disease and therefore in many of the milder cases cannot be depended upon as a diagnostic point.

The treatment of choice is operation unless the case is of a very mild type and the best hospital facilities for medical treatment are available. The operation described by the author is the Rammstedt pylorotomy. An incision is made in the long axis of the bowel through the enlarged circular muscle fibers down to the mucous membrane, care being taken to avoid injuring the mucosa. This relieves the pressure of the tumor on the pyloric lumen and allows the muscular coats to retract.

A pathologic study made of a case six months after operation showed that retraction of the muscles permitted the opening to gape, and that

the space had been filled with organized tissues. The pyloric lumen was dilated and performed its function well, demonstrating that the operation was efficient. The tumor mass which was plainly visible at operation had disappeared.

E. A. PRINTY.

Peple, L.: Congenital Pyloric Stenosis. Comparison of Operative Procedures for Its Relief, and a Contribution to the Technique. *Virginia M. Month.*, 1919, xlvi, 25.

The symptoms of congenital pyloric stenosis usually begin from the second to the fourth week, and their onset is gradual. In an infant otherwise not ill there is persistant vomiting after the ingestion of food, distinctly visible peristaltic waves from the cardia to the pylorus, a decrease in the size and frequency of the stools, and an olive-shaped mass which may be outlined.

The two most frequent operative procedures for the condition are posterior gastro-enterostomy and pyloroplasty. To the former there are many objections. The author prefers the Rammstedt pyloroplasty because it is simple, may be performed in a short time, and there is little danger from hæmorrhage.

Four cases are reported, in two of which a posterior gastro-enterostomy was done, and in two, a Rammstedt operation. All the patients recovered. In cases of this kind the author uses a special table which rests on the regular operating table and contains a compartment for hot-water bottles.

I. E. BISHKOW.

Hendon, G. A.; Duodenal Fistula; with Report of a Case. *South. M. J.*, 1919, xii, 199.

Careful search of available literature reveals the record of only a few cases of duodenal fistula. When the anatomical location of the duodenum, and especially the proximity of the retroperitoneal fixed portion to certain other intra-abdominal viscera is considered, it seems remarkable that this portion of the bowel so frequently escapes injury during operations for hepatic, renal, gastric, and cholecystic pathology. On the other hand, duodenal fistula may result from a minute perforating ulcer. If such a fistula is recognized sufficiently early, it should be amenable to treatment by the intelligent application of modern therapeutic principles.

The author reports the case of a patient, 70 years of age, upon whom nine years previously a cholecystostomy had been performed. Early in 1917 he again suffered from attacks of epigastric colic for which the author performed a cholecystectomy. Symptoms of common-duct obstruction followed the operation, and four months later a drain was inserted into the cystic duct with the idea of making a permanent fistula. As this opening closed, a second attempt was made two months later. During the course of the operation there was a gush of thin, viscid material mixed with bile. The next day copious discharges of duodenal contents began. The skin was protected with a rubber dam, and the fistula packed daily with gauze strips saturated with compound tincture of benzoin. Within five weeks from the date of the last operation the fistula had entirely closed, and the patient has remained in good health ever since.

In 1914 Mayo reported three fatal cases of duodenal fistula following right nephrectomy, death occurring within two weeks. In 1915 the same author reported a successful closure of a duodenal fistula following right nephrectomy.

Palmer records two cases of duodenal fistula cured by expectant treatment, which he says has several objects: (1) the protection of the skin, (2) the introduction of fluids and nourishment in quantities sufficient to maintain not only life, but also the reparative power of the tissue, (3) a reduction in the amount of the gastric and intestinal excretions, and (4) the neutralization and dilution of these excretions. As protective measures he recommends paraffin with a low melting point applied hot to the skin, or a solution of pure gum rubber in benzine. To supply fluids, 10 per cent glucose solution with sodium bicarbonate may be administered per rectum. Acid-producing food must be avoided and alkalies given instead. Atropin and epinephrin have an inhibitory effect on the gastric excretion. Milk, fats, and oils may be used.

V. C. HUNT.

Cannaday, J. E.: Long Resections of Intestine. *Ann. Surg.*, 1919, lxix, 425.

The small bowel varies from 15 feet, 6 inches to 31 feet, 10 inches in length, the average length being greater in the female. The large intestine varies in length from 3 feet, 3 inches to 6 feet, 6 inches. People who have for generations subsisted largely on a coarse vegetable diet have a longer intestinal tract than those who have lived on more concentrated food. The removal of the large bowel seems to interfere little with the general bodily nutrition, but after resection of considerable lengths of the small intestine, it is necessary to husband the patient's physiological resources carefully. It has been found rather generally, however, that patients survive in a fair state of health after the removal of even half of the small intestine.

The author reports a case in which it was necessary to resect 300 cm., (10 feet) of the small intestine and the cæcum, including 20 cm. of the ascending colon, owing to extensive ileocaecal tuberculosis. After a rather stormy convalescence during which it was necessary to reopen the abdomen twice, the patient made a good recovery and left the hospital at the end of the fourth week. At this time the average number of stools a day was three. About two months after operation he returned with a severe cold and died shortly afterward with the symptoms of acute tuberculosis. The postmortem examination showed that, with the exception of a few adhesions in the location of the former drainage

tubes, the abdomen was in excellent condition. The small intestine up to the duodenojejunal juncture was found to be only 5 feet, 7 inches in length while the large bowel measured 4 feet, 9 inches. There were no visible signs of visceral tuberculosis.

Fantino has suggested that in cases of extensive resection a circle be established in the remaining segment of intestine in order to keep the intestinal contents in the bowel for a longer time. According to Turck, short-circuiting is preferable to resection whenever possible and particularly if the lower ileum is involved. In the author's case, however, the involvement was too extensive.

The article is concluded with a list of cases of long resections of the intestine taken from Park, Moynihan, and others, and brought up to date.

GATEWOOD.

Farr, C. E.: Appendicitis in Children. *Arch. Pediat.*, 1919, xxxvi, 207.

The author draws the following conclusions:

1. Appendicitis in children is probably more common than is generally believed because of inaccuracies in the case histories and the impossibility in many cases of making a careful physical examination.

2. The apparently higher rate of mortality among children may be attributed to the fact that only severe cases are diagnosed and operated upon and that children have less resistance to infection.

3. Many case histories have shown that the progress of the disease is little, if any, more rapid in children than in adults.

4. On the basis of a series of 420 cases, it is very evident that early diagnosis and operation in the milder cases would probably decrease the mortality by half.

E. A. PRINTY.

Downing, A. T.: Hernia of the Small Bowel into the Rectum. *Boston M. & S. J.*, 1919, clxxx, 585.

In the case reported there was severe abdominal pain with persistant vomiting and involuntary diarrhœa suggesting peritonitis. Five days after the onset, when the patient was admitted to the hospital, the pulse was rapid and weak, the temperature 97, and the leucocyte count 14,000. The abdomen was rigid and distended and tender all over. The urine showed acetone.

At operation, the abdomen was found to contain seropus and fæcal material. Examination of the appendix showed acute gangrene without macroscopical perforation and a hernia of the small bowel into the rectum.

I. E. BISHKOW.

Chevassu, M.: The Surgery of the Left Colic Angle by Lateral Flank Incision (La chirurgie de l'angle colique gauche par l'incision latérale du flanc). *Bull. et. mém. Soc. de chir. de Par.*, 1919, xlv, 614.

The surgery of the left colic angle is especially difficult because of the depth and slight mobility of this portion of the intestine. In operations on the kidney Chevassu usually makes a lateral incision and this induced him to try it in a recent operation for the removal of a cancer of the left colic angle.

When a thin patient is placed in a dorsolateral position with a block under the lower part of the thorax, the right thigh flexed and lying horizontally upon the table, and the left leg extended in external rotation, the end of the eleventh rib will be seen on the axillary line or a little behind it. The termination of the tenth intercostal space just in front is the point at which the lateral flank incision to which Chevassu refers is begun. This incision may then be carried upward between the ribs for a distance of several centimeters without danger of opening the pleura. With the bistoury held horizontally, the flank is incised parallel to the fibers of the obliquus major so that in passing close to the point of the eleventh rib the incision opens the peritoneum in such a way that a loop of colon is immediately exposed.

In some cases this loop is mobile and is then found to be the end of the transverse colon; in others it has very little mobility and is formed by the first part of the descending colon. In any case the juxtasplenic portion of the colon is exposed. A slight pulling on the afferent and efferent loops is then sufficient to draw the angle into the wound. A stroke of the bistoury on the phrenic and splenocolic ligaments then makes of the left portion of the colon a loop as mobile as the pelvic colon and as easily drawn out.

In the case of cancer reported, Chevassu made a flank incision about 10 centimeters long. When the tumor was brought into the wound it was found to be adherent by its anterior surface to the left edge of the great omentum. The involved part of the omentum was resected away. The amount of intestine exposed measured about 30 centimeters and more could have been exposed if it had been necessary.

The operation as performed in this case by Chevassu was divided into two stages. In the first, the affected loop of colon was brought to the surface and the peritoneum completely closed. When fixed to the abdominal wall it was kept covered with compresses wet with physiologic serum. The second stage consisted in the resection of the cancerous mass and was done six days later.

The facility with which the colon is reached by the lateral incision led Chevassu to believe that it might often be advantageous to replace the left iliac anus created preliminary to operation for the extirpation of rectocolic cancers by a colic anus formed at the level of the flank. He has just performed such an operation on a patient with multiple tumors of the rectum which he expects to extirpate shortly. No particular difficulty was encountered and it was not necessary to make an incision more than 5 centimeters long. In the author's opinion a colic anus has several advantages over the iliac anus.

W. A. BRENNAN.

LIVER, PANCREAS, AND SPLEEN

Willis, A. M.: Stone in the Common Duct; with Analysis of Fifty Cases. *J. Am. M. Ass.*, 1919, lxii, 1343.

Probably in no other branch of abdominal surgery have greater advances been made than in the surgery for the relief of symptoms arising from the presence of biliary calculi.

While calculi do recur, i.e., new stones are formed or descend from higher levels, most of the so-called "recurrences" are in reality calculi which were overlooked at the time of the primary operation.

Calculi are present in the ductus choledochus, either alone or associated with calculi elsewhere, in a comparatively large number of patients operated upon for the relief of gall-stone symptoms. The incidence varies from as low as 4 per cent according to the older reports to as high as 20 per cent according to more recent compilations.

At least three explanations may be advanced to account for the discrepancies in the figures given by different surgeons as to the relative frequency of stones in the common duct:

1. The more skilled and experienced surgeon will detect calculi in this location when their presence would not be revealed to a less skilled operator.

2. Patients who suffer from recurrences and those with the severe symptoms generally associated with calculi in the common duct seek aid from surgeons of wide reputation. Therefore the clinics of such men have a larger proportion of cases of this kind.

3. Some authors may include in their series cases of cholecystitis without calculi which, of course, would serve to reduce the proportion of cases in which stones are present in the common duct.

The total number of gall-bladder operations performed in the author's practice and in association with other colleagues is 620. Of this number, 512 showed the presence of calculi somewhere in the biliary passages, while in 108 instances the condition was cholecystitis without calculi. Stones were found in the common or hepatic duct in 50 cases, approximately 10 per cent of the total number of those in which calculi were found.

In 14 of the cases of stones in the common duct the patients had been operated upon previously. In 4 instances the presence of the stones in the duct was discovered at the time of the primary operation, but in view of the patient's serious condition it did not seem wise to perform a choledochotomy at that time. In 5 of the remaining 10 cases, stones in the common duct had not even been suspected, either from the patient's history or palpation of the duct.

However skillful a surgeon may be, he will fail to discover a certain number of common-duct stones because of the fact that the last or retroduodenal portion of the duct, particularly where it passes through the head of the pancreas, is at times difficult to palpate and, according to Robson, this is the part of the duct in which the greater number of the common-duct stones lie.

Exploration of the duct will reveal stones that otherwise would have been overlooked and therefore should be done (1) if the classical symptoms of stone in the common duct—chills, fever, and icterus—are present, (2) if the duct is enlarged and thick walled, (3) if many small calculi are present in the gall-bladder or cystic duct, or (4) if the gall-bladder is atrophied. While the routine opening of the common duct in all patients with gall-stones is not justifiable, a certain number of stones will be overlooked unless it is done.

The author reports 5 cases with a fatal termination. Hæmorrhage was the striking feature in all. The most rapidly fatal hæmorrhage occurs in patients who have an acute exacerbation superimposed on the chronic jaundice. Acute jaundice is not so potent a factor in producing a hæmorrhagic diathesis as chronic jaundice. Therefore, the appearance of jaundice in common-duct cases will hereafter be an important factor in the author's decision for immediate operation.

The article is summarized as follows:

1. A considerable number of patients suffering from cholelithiasis have stones in the common duct.

2. A certain number of cases of stones in the common duct do not present symptoms sufficiently suggestive to justify exploration of the duct, and in some of these cases palpation will fail to disclose their presence.

3. Even exploration of the duct may not reveal the presence of calculi though the previous and subsequent history of these patients may indicate or prove that they were actually present.

4. The mortality in common-duct cases operated upon is given variously at from 6 to 16 per cent. In the author's series, 5 patients died, a mortality of 10 per cent. In the cases in which there were no calculi the mortality was about 2 per cent. The obvious lesson is that in cholelithiasis operation should be performed early before the entrance or the formation of calculi in the common duct and that cholelithiasis is essentially a surgical problem.

E. A. Printy.

Andrews, E. W.: Cholecystectomy and the Management of the Proximal Stump of the Cystic Duct. *Surg. Clin. Chicago*, 1919, iii, 237.

Removal of the gall-bladder does not give immunity from recurrence of the trouble in the biliary system and an appendage is removed which would be useful if later drainage of the gall-tracts either externally or by a cholecystenterostomy isr equired. Moreover, secondary operations are often more easy to perform if the gall-bladder has not been removed. One form of recurrence after "ectomies" is the development of what appears to be a new gall-bladder, i. e., dilation of the proximal stump of the cystic duct. In performing a cholecystectomy, therefore, the entire length of the cystic duct should be removed.

According to the author's technique, the clamp is used only for the distal side of the cystic duct.

and with a fine aneurism needle a ligature is placed on the proximal side. This is tied firmly before the duct is divided. By making traction on the ligature, the remainder of the stump of the cystic duct is freed down to the wall of the common duct, and a second amputation is done very close to the outlet. In many instances it is better not to ligate but to cut it close and introduce a probe, split the common duct, and explore it in both directions. A T-shaped tube which will permit drainage of the choledochus during the after-treatment should then be introduced. The remaining steps are ligation of the cystic artery and subserous enucleation of the body and fundus of the gall-bladder with closure of the peritoneal flap so as to obliterate the raw surface next to the liver. In the case reported the abdominal wound was closed without drainage. In cholangeitis and severe sepsis, however, it is best to drain, preferably through a stab wound just in front of the right kidney. E. A. PRINTY.

Masson, J. C.: Exposure in Gall-Bladder Surgery. *Ann. Surg.*, 1919, lxix, 422.

It is now generally agreed that there are few cases in which the patient's best interests are served by merely draining the gall-bladder, although it must be admitted that in the hands of the casual operator cholecystostomy is safer than cholecystectomy. There is still considerable argument, however, as to which method of removing the gall-bladder is to be preferred. The author maintains that with good exposure it is possible to excise all gall-bladders by beginning at the cystic duct.

According to the method of choice, an incision is first made extending from the midline at the tip of the ensiform cartilage to a point 2 inches to the right of the umbilicus. After the usual exploration of the abdomen, the stomach, omentum, and intestines are packed off with three or four abdominal sponges and held in place by the assistant's left hand. It is important that the assistant should not move this hand after the sponges are once arranged. In the exceptional case additional exposure may be obtained by inserting a pack (4 inches by 3 feet) between the posterior-superior surface of the liver and the diaphragm.

Owing to the frequency of anomalies of both ducts, it is absolutely necessary to know just what each forceps includes before it is clamped. In cases of large, tense gall-bladders it is often advisable to empty the gall-bladder with a trocar first and then apply a 6-inch curved forceps to the fundus and another to the ampulla where it overlies the common duct. By a little tension on the lower forceps, the cystic duct may be isolated throughout its entire length. Before cutting the cystic duct, the common duct should be palpated. If exploration is warranted, the author believes it is preferable to make an incision in the common duct rather than to attempt investigations through the open end of the cystic duct. While in the occasional case in which it is very difficult to expose the cystic duct and artery it may be necessary to begin the removal of the gall-bladder at the fundus, the author strongly maintains that this operation is very rarely indicated.

GATEWOOD.

SURGERY OF THE EXTREMITIES

DISEASES OF BONES, JOINTS, MUSCLES, TENDONS. GENERAL CONDITIONS COMMONLY FOUND IN THE EXTREMITIES.

Ferris, A. W.: Case of Osteitis Deformans. *Med. Rec.*, 1919, xcv, 853.

The author first saw the patient, a woman 55 years of age, in January, 1913. At that time she was suffering from pain in various joints, had great difficulty in sitting and rising, and walked with a waddling gait. In 1907 she had "rheumatic pains" for the relief of which she went to Europe. She lost much weight due to drinking large quantities of vichy water, and on her return was in perfect health. In 1910 she began to have occasional pains in both knees and noticed that her legs were becoming bowed. During the winter of 1910-11 she was treated for "rheumatic gout" but did not improve. At this time it was noticed that her temples had become shrunken and her head somewhat triangular. Various treatments were instituted without relief. During 1912 she had pain in the wrists and elbows, and recently there had been nocturnal pain in the left hip.

Paget in 1877 reported the first case of the kind under the name "osteitis deformans." In 1901, Packard, Steele, and Kirkbride published a paper in which 100 cases were considered, but only 67 were regarded as true cases. Another instance was reported in 1912 by Jones, who stated that, as far as he was able to discover, only 26 cases had been reported in this country since 1901. Of the 68 cases, 42 occurred in males and 26 in females. The oldest patient was 73 and the youngest 39 years of age.

The oldest patient whose case is on record was a woman 92 years of age, while the youngest was a girl of 16.

The general health is usually unimpaired, even when the cranial bones are thickened. All patients complain of pain in the bones affected, usually of a rheumatic or neuralgic type. The larger bones are usually affected first, then the skull, and then the upper extremities. Probably involvement of the spine, which consists of forward flexion and shortening, comes next. The neck becomes fixed and the head inclines forward, sometimes being more or less dropped on the chest. The joints are rarely involved, although in consequence of the bowing

deformity of the legs, walking is often painful and difficult. Nothing is known of the etiology.

In regard to the pathology, von Recklinghausen advanced the theory that the disease starts out as a true osteomalacia associated with inflammatory processes which lead to the transmission of medullary substances into fibrous tissue over which new bone grows.

The earliest pains are probably due to a stretching of the periosteum caused by the deposit of inflammatory products and new bone beneath it. The later pains are probably due to distortion of the joints.

Examination of the author's case showed that the bones of the skull formed a much larger proportion of the cranium than they should as compared with the bones of the face. The curves of the clavicles were increased. The arms were too long for the body and were curved with an inward convexity. There was dorsal kyphosis, but no scoliosis. The pelvis was not noticeably enlarged. The glutei were prominent, though flabby, and showed atrophy. The trochanters were not higher than normal and the necks of the femora were not horizontal, a fact noted in a large proportion of the cases reported. Both femora were curved outward and forward, the left more so than the right. The left tibia was also more involved. The patient was 2 inches shorter than she was four years ago. Standing with heels together, the distance between the internal malleoli was 2.4 centimeters while between the internal condyles of the femora it was 18 centimeters. The outward bowing was most evident in the left femur and least evident in the upper ends of the tibiæ. The femora appeared slightly enlarged on palpation. The heads of the tibiæ were enlarged.

There was no tumor formation; external rotation and abduction of the femur was good on the right side, but restricted on the left. Flexion of either knee was somewhat difficult. The arm muscles were somewhat atrophied; the supra- and infraspinatus, noticeably. The knee jerk was diminished. There was no abnormal reflex. The skull measurements were as follows: Glabella to occipital protuberance, 37 centimeters; biparietal, 16½ centimeters; and circumference, 56½ centimeters. No definite line of treatment was followed. J. J. KURLANDER.

Corner, E. M.: Infective Scar Tissue and its Relation to Pains, Particularly Painful Amputation Stumps. *Lancet*, 1919, cxcvi, 840.

Beneath the sawed end of the divided bone is a dead space which becomes filled with scar tissue taking its character from that of the healing of the wound. When the wound heals well, the space is filled with non-infective scar tissue. In other cases the scar tissue is irritative and infective because of the microörganisms imprisoned in its meshes. Hence the local cause of painful nerves is to be found in a terminal infective neuritis rather than a "bulbosity." A bulbous nerve results from every division of a nerve trunk. If the ends of the nerve are inflamed the bulb is bigger and more tender.

When situated in infective scar tissue, silk and other unabsorbable material, such as iron, is slowly fragmented and removed. It is not isolated by encapsulation as in ordinary non-infective scar tissue. Therefore all foreign bodies should be removed and their tracks drained.

Among channels for disseminating the irritation of infection the vascular lymphatics come first as they carry the infection the greatest distance.

In the regeneration of nerves, a "regeneration neuroma" or multiple neuromata are formed, and if the newly formed regeneration fibers, tender and destitute of a medullary sheath, branch and grow into scar tissue which is still irritative and infective, pain is bound to result. If in the interval the scar tissue has been rendered non-irritative by the body chemicals, regeneration is not accompanied by pain. E. B. FREILICH.

Wallace, J. O.: The Diagnosis of Syphilis of the Bones and Joints. *J. Orthop. Surg.*, 1919, i, 258.

The diagnosis of syphilis of the bones and joints has been neglected. A complete history, particularly with regard to past illnesses which may have been luetic, is an essential.

The series of cases reported included only cases of joint involvement which were secondary to bone lues.

The onset is generally insidious and characterized by frequent relapses. Pain is a prominent feature of the clinical picture. Swelling is present in 50 per cent of the cases, while in 70 per cent there are points of tenderness. Fluctuation is present in 9 per cent. In swollen joints it is the bone and not the soft parts which is enlarged. This is a diagnostic sign.

Twenty-four of 38 cases gave a positive Wassermann test, 2 were doubtful, 8 were negative, 1 negative with a positive luetin test, and in 4 no Wassermann test was made.

In this condition roentgenograms show a periostitis or osteitis or both. Either may be general or local. In the former there are successive layers of subperiosteal calcareous deposits due to successive attacks of periostitis.

In the X-ray examination osteitis gives shadows which accentuate the normal cortical or spongy bone and are due to sclerosis. This sclerosis may be external, causing bowing, or internal, obliterating the medullary cavity.

Gummata may be multiple or single and show on X-ray examination a translucent center surrounded by a sclerotic wall with usually an area of periostitis over it.

The author summarizes the points in the differential diagnosis as follows:

DIFFERENTIATION FROM TUBERCULOSIS

In syphilis the process begins in the epiphyseal end of the diaphysis or in the shaft, while in tuberculosis it begins in the epiphyses.

There is marked periosteal thickening in syphilis, while there is little or none in tuberculosis.

In syphilis there is bone proliferation, in tuberculosis bone destruction.

In syphilis there is hypertrophy; in tuberculosis, atrophy.

In syphilis the swelling is due to thickening of bone while in tuberculosis it is caused by thickening of the soft parts.

In syphilis suppurating sinuses are rare while in tuberculosis they are not uncommon.

In syphilis multiple lesions are common, while in tuberculosis they are rare.

DIFFERENTIATION FROM CHRONIC PYOGENIC OSTEOMYELITIS

In syphilis, periostitis is marked, while in chronic pyogenic osteomyelitis it is not so marked and may be slight or absent.

Osteosclerosis and osteoporosis are more uniform in syphilis than in chronic pyogenic osteomyelitis.

An involucrum is present in chronic pyogenic osteomyelitis but not in syphilis.

Newly formed bone is thinner and more porous and the borders are thinner and more irregular in chronic pyogenic osteomyelitis than in syphilis.

In chronic pyogenic osteomyelitis there is extensive destruction or absence of bone cortex and a sequestrum large or small, while this is absent in syphilis.

Some cases are hard to differentiate.

DIFFERENTIATION FROM SARCOMA

Sarcoma affects the ends of the diaphysis by preference.

There is some disturbance in the minute structure of the bony tissue. It consists of absorption of lime salts. In certain areas there may be increased density. This disturbance is comparatively localized and spreads peripherally, the greatest destruction being at the point of origin. Associated are swelling and new growth. If the sarcoma is central, the walls of the bone seem to be bursting apart. In cases of peripheral sarcoma the surface of the bone is found to be rough and uneven and the density shades gradually into the soft tissues. In this peripheral variety the periosteum is often found lifted up highest over the greatest diameter of the tumor and then slopes gradually downward until it becomes a part of the bone again.

DIFFERENTIATION FROM CARCINOMA

In carcinoma there is never any tendency to bone hypertrophy, as would be expected from the pathology. It evolves not only in the bone substance but in the stroma as well. Therefore there is almost complete destruction of the bone. The bone substance remaining in the tumor is spongy, porous, and eroded.

DIFFERENTIATION FROM RACHITIS

In rachitis the epiphyses may be absent or cloudy in the roentgenograms while in syphilis they are clear and not seriously disturbed.

The changes at the epiphyseal end of the diaphysis appear in syphilis in the fœtus or in the new-born, while in rachitis they occur at the time of the first dentition.

Cortical thickening in rachitis is endosteal and is always on the concave side of the curve, while in syphilis it is periosteal and is uniformly on the convex side of the curve.

The two conditions are often associated, making the differential diagnosis very difficult.

Twenty-six case records are given with comments and roentgenograms of the various luetic conditions and lesions to be considered in the differential diagnosis.

The article is summarized briefly by the author as follows:

1. From the relatively small number of cases in hospital records and in the literature, it would seem that syphilis of the bones and joints has been largely overlooked, particularly before the X-ray and Wassermann were in general use. At the present time, we exclude syphilis as a primary or complicating factor in all cases of bone and joint disease.

2. Syphilis is often present as a complicating factor or may be merely coincidental when the disease of the bone or joint under consideration has some other etiological factor such as tuberculosis, osteomyelitis, or rachitis. Therefore a history of syphilis, the presence of other manifestations of the disease, or a positive Wassermann does not prove that the bone or joint under consideration is syphilitic. It must not be forgotten that a positive Wassermann or a positive von Pirquet is not prima facie evidence that the disease exists alone, and that syphilis is an excellent medium for the implantation of tuberculosis or any other infection.

3. A history of syphilis or the presence of other manifestations of the disease is of value in suggesting its presence, but not of any absolute diagnostic value, as it does not exclude the presence of tuberculosis or other bone and joint diseases.

4. In studying symptoms and physical signs alone it has been impossible to differentiate those due to syphilis of the joints from those due to other etiological factors.

5. The Wassermann reaction is very valuable, but only as one point in the diagnosis. Although in many of the cases reported the Wassermann reaction was negative, the condition was undoubtedly syphilis, as shown by the X-ray and the response to antisyphilitic treatment. Cases have been observed also in which the Wassermann was positive although the condition in the bones and joints proved to be some other disease. In some of the cases syphilis was undoubtedly a complicating factor because improvement was not marked until antisyphilitic treatment was instituted. A routine Wassermann is taken in all our cases of bone and joint disease, and in those which are negative but in which the clinical symptoms or roentgenograms suggest syphilis, a provocative Wassermann has been found in some instances.

6. The luetin test has also been found to be of value as it is sometimes positive when the Wassermann reaction is negative.

7. The finding of a negative von Pirquet is of value in doubtful cases.

8. The roentgenogram is the most valuable factor in the diagnosis of syphilis of bones and joints and in differentiating it from other conditions. In one case there was a history of a primary infection and the Wassermann was positive. The roentgenogram, however, showed nothing suggestive of syphilis but indicated the presence of tuberculosis. On section of the bone and pathological examination the condition was reported to be tuberculosis. In the cases reported syphilitic arthritis was not found without bone involvement. The roentgenogram of the joint involved may indicate nothing, while a roentgenogram of other bones or those contiguous to the joint may show a typical syphilitic osteoperiostitis. In one case in which complaint was made of discomfort in the knee, a roentgenogram showed typical syphilitic involvement of the radius and ulna. In studying the roentgenograms it has been impossible to discern any difference between cases in which the condition was acquired and those in which it was congenital, with the possible exception of congenital syphilitic osteochondritis.

9. The so-called therapeutic test is also of some value in the diagnosis of obscure bone and joint lesions when an absolute diagnosis cannot be made from the clinical and laboratory findings.

In 38 cases of bone and joint syphilis, the condition was congenital in 22 and acquired in 16. In 34 cases in which an X-ray examination was made, only 8 patients had an involvement of one bone alone, and 16 an involvement of the joints as well as the bones. K. L. VEHE.

O'Reilly, A.: Subdeltoid Bursitis and Stiff and Painful Shoulder. *J. Missouri M. Ass.*, 1919, xvi, 149.

In subdeltoid bursitis the structures which play the most important part are the bursa and the tendon of the supra-spinatis muscle. Any force which drives the head of the humerus upward may injure the bursa or the tendon or both, causing an inflammatory reaction in the former. Bursitis may result also from infection.

There are three types of bursitis: (1) acute or spasmodic, (2) subacute or adherent, and (3) chronic or non-adherent. In the first type the pain may be severe, located on the point of the shoulder just below the acromium, and referred to the deltoid insertion or the elbow and fingers. In Types 1 and 3 with free motion the Dawborn sign is elicited by abducting the arm. The point of tenderness which is just below the acromial tip disappears as the bursa passes beneath that process and reappears on adduction.

Patients with subdeltoid bursitis cannot put their hands to the small of the back or the back of the neck. Motion may be limited in the shoulder but about 10 per cent persists even when the condition is severe, while in true joint involvement this last fraction is obliterated.

Codman described a test according to which the patient who is unable to raise his arm is told to bend forward and touch his toes. In so doing he is aided by gravity and as he straightens the surgeon raises and holds the arm up. The arm is then vertical without pain, but on lowering it the pain recurs.

Acute cases are treated with rest, salicylates, and iodides. The patient is put to bed with the arm in abduction held by a sling attached to the head of the bed. Later and in other types, radiant heat, passive motion, massage, and resistive motions are used. Occasionally the adhesions should be broken up with the patient under the influence of an anæsthetic. Very rarely it is necessary to open the bursa and break and cut the adhesions. The former was done in 4 instances, the latter not at all, in the writer's series of about 75 cases.

K. L. VEHE.

Lowman, C. L.: Rotation Deformities. *Boston M. & S. J.*, 1919, clxxx, 581.

In correcting weak, pronated feet the author directs his attention to two chief factors: (1) the control of the whole leg lever, and (2) the correction of the torsion deformity of the foot. In some of his cases, although the feet were quite flexible, the patients could not be made to use them in proper relation to their legs. When the knees were flexed in the normal plane, the feet were averted and toed out.

When such feet were held in varus by using Thomas heels, the muscle strain was relieved but the anteroposterior axis of the feet did not coincide with that of the knee and a certain amount of out-toeing remained which could not be corrected. When by determination on the part of the patient, the feet were used in the straight position, the inward rotation of the thigh still persisted. The knee action was then in a plane inside the anteroposterior axis of the foot and the inward rotation in the hip joint was in direct relation to the foot position.

The author's efforts to control the high rotation consist first in correcting or lessening the degree of rotation by raising the inner border of the foot and throwing the heel in varus, and second, in removing the twist from the forefoot. This is accomplished in flexible feet by adducting the forefoot or checking its abduction by lowering the foot plate under the cuneiform and first metatarsal. The lacing of the shoe then exerts a downward and backward thrust while the fulcrum under the scaphoid and front of the os calcis controls the tendency to lower and pronate at those points. The reverse twist is aided by thickening the sole of the shoe under the fifth metatarsal shaft and head. The common practice of raising the inner border of both sole and heel tends to throw the entire foot into varus and prevent the torsion of the forefoot. After tension

on the rotary apparatus is lessened, all the muscles and ligaments that prevent inward rotation are strengthened and toned up.

The muscles are the pyriformis, gemellus, obturator, and gluteal groups. In many foot cases operated upon relapse occurs because the rotation deformity received no consideration. Severe rotation deformities are seen in paralysis, club-foot, and congenital hip conditions. In a number of cases presenting a more or less severe degree of rotation of the shaft of the femur or tibia, osteotomies are frequently performed with excellent functional results. J. J. KURLANDER.

FRACTURES AND DISLOCATIONS

Dehelly, G., and Loewy, G.: Effacement of Cavities in the Treatment of Fracture. *Ann. Surg.*, 1919, lxix, 367.

A dead space between the tissues plays a very important part in infection. A free space between two layers of tissue becomes filled with blood or serum. If the wound remains sterile this hæmatoma becomes encysted and is progressively reabsorbed, but if a sufficient number of virulent bacteria have contaminated the cavity, suppuration transforms it into an abscess.

These facts have not been sufficiently emphasized in the treatment of fractures. Cavities have been drained, but not enough attention has been paid in cases of infected fractures to effacing the cavities formed by the displacement of the fragments. The authors believe that bridged plaster casts and immobilization by means of traction and suspension such as that obtained by the Thomas and Blake splints, have a great drawback in that they do not permit the compression of the focus of the fracture.

Whenever possible after the sterilization of a fracture of the femur, the authors have used the Hennequin apparatus and believe that they have obtained much better results. This apparatus consists of a wire frame well padded with surgical cotton and arranged with two straps so that it can be made to apply snugly to the wounded member and exert an even pressure upon it throughout its extent.

In operating upon the different types of cavities the authors have endeavored to follow the general rules of surgical technique: (1) the operation itself must not create a cavity in or near the bone; (2) the overlapping fragments must not be cut perpendicularly to the axis of the bone for this leaves a triangularly shaped dead space; (3) when it is necessary to gutter a long bone, three sides rather than one must be removed so that the soft parts will fall in and obliterate the dead space.

The authors cite a number of cases as examples of their method of handling infected fractures. In amputations of the leg they advise the removal of the fibula as it is not necessary for the solidity of the stump. GATEWOOD.

Fresson, H., and Toupet, R.: The Treatment of Supracondylar Fractures by Steinmann's Nail-Fixation Method (Traitement des fractures sus-condyliennes par la broche de Steinmann). *Rev. de chir.*, Par., 1918, lvi, 161.

Of all war fractures general experience has shown that supracondylar fractures are the most formidable because of both their immediate and their end-results. Up to the end of 1917, before using the Steinmann nail or pin fixation, the authors had treated 117 of such fractures according to all other known methods. In this series of cases there were 7 deaths in cases in which amputation was not performed, 11 deaths after amputation, and 42 failures. These results do not differ appreciably from those obtained in other surgical centers.

In a series of supracondylar fractures treated by Steinmann's method during 1918 the mortality was only 6.1 per cent and there were no amputations. The deaths were those of patients with multiple wounds and occurred within the first forty-eight hours after the injury. The difference in the prognosis of such fractures is very marked when a method is employed which reduces the backward displacement of the inferior fragments and hence obviates the immediate or late complications. The danger consists especially in the basculation of the inferior fragment; apart from ulceration it may traumatize the tissues, set up ischæmia, and render them incapable of resistance against gangrene. The area cannot be correctly dressed, and in spite of the most minute surgical clearance and Carrel-Dakin irrigation there is often marked suppuration, the knee becomes infected, and an amputation is required.

The authors review the various methods that have been employed in treating supracondylar fractures and show that with all, except Steinmann's nail-fixation method, an insufficient or an incorrect reduction of the fragments is obtained.

The nail-fixation method was originated by Codavilla in 1903 for a particular case, but it was Steinmann of Berne who generalized it and applied it to all irreducible fractures. His "Nagelextension" method was executed with two nails or pins embedded for some centimeters in the femoral epiphysis and planted obliquely. The fear of the spread of infection from the area of fracture to the epiphysis has deterred most surgeons from using the method, and, in France at least, it was rarely employed before or during the war. The few who did use it, however, reported good results.

The nail-fixation method fulfils two functions: (1) it reduces the over-riding; and (2) it reduces the backward basculation of the inferior fragment.

A number of schematic drawings are given with explanations showing how these effects are produced. Traction is exerted in proportion to the amount of over-riding.

The single pin or nail used by the authors is made of very rigid steel wire 3 millimeters in diameter and 15, 16, or 17 centimeters long; it is left quite plain without nickeling or other finish.

The metallic tractor is shaped like a horseshoe. In one extremity is a hole through which the pin passes on exit from the limb and in the other a hook by which the other end of the pin is held. The nickel strip of which it is composed is 25 millimeters wide and 2 millimeters thick. The point where the pin should be inserted is discovered by palpation and the pin is placed in position with the aid of local anæsthesia. The exact technique to be followed is described in detail and illustrated.

Of the 32 supracondylar fractures treated, 6 were closed fractures. As stated, there were two deaths, these two cases being really beyond the resources of surgery. Eighteen of these patients left the hospital with their fractures perfectly consolidated and able to walk; in 14 instances the fractures were consolidated and the pins removed but the patients were evacuated in a plaster cast for military reasons. In one case the fracture was reduced but had not yet consolidated. Shortening was always negligible.

The authors conclude from their experience that the best method of treating supracondylar fractures is by traction exerted through a nail-fixation apparatus. This method is also the best whenever it is necessary to exert traction on a flexed knee or when energetic traction must be used.

Several case histories with radiographs are given.

W. A. BRENNAN.

Stoner, A. P.: Fractures Complicating the Ankle-Joint. *J. Iowa M. Soc.*, 1919, ix, 148.

The author gives a detailed description of the ankle. Formerly, before the use of the X-ray, many cases of fracture about the ankle-joint were diagnosed as sprains.

Fractures of the ankle-joint are most frequently the result of a fall or of jumping from a height, and the type of fracture depends upon the position of the foot at the time of injury. In setting the fracture the foot should be placed in the opposite posture from that in which it was when the fracture occurred.

Points about Pott's fracture to bear in mind are:

1. Pott's fracture is always an eversion and abduction fracture.

2. The fibula is always fractured and usually within 1½ inches of the point.

3. The tibiofibular and interosseous ligaments are always ruptured, permitting more or less separation of the lower fragment of the fibula from the tibia.

4. For proper healing in Pott's fracture the foot should be placed in the most exaggerated adducted and inverted position and maintained in this posture until healing is complete.

5. An inversion fracture is never a Pott's fracture and should be put up in the reverse position, abduction and eversion.

6. The joint should not be exercised until after a period of eight weeks, and no weight should be borne on the foot for three or four weeks longer.

I. E. BISHKOW.

SURGERY OF THE BONES, JOINTS, ETC.

Cotton, F. J.: The Lengthening of Stumps. *Mil. Surgeon*, 1919, xliv, 465.

This article describes a transplanted-flap operation for stumps which conserves their length and may be substituted for the old and common method of re-amputation of stumps which need repair. It is the method used in plastic surgery to secure flaps of skin from distant parts of the body—"whole thickness" flaps, including skin, fat, subcutaneous tissue, and even fascia—for covering denuded areas. A case of remodeling of a thumb stump in this way is described.

Instead of sacrificing bone which ought not be lost, soft tissue which can easily be spared is transplanted by a two-stage operation, a method familiar in industrial surgery and very greatly developed during the war.

Emphasis is placed upon the necessity for exact apposition of the edge of the graft to the edge of the wound as upon this it seems depends the nutrition of the flap rather than upon the contact of the bottom of the flap which, as a source of blood supply, is of only secondary importance. To such accurate apposition the author attributes his present 100 per cent of "takes." Another requisite of success is good hæmostasis, neglect of which results in the formation of a hæmatoma beneath the flap. The latter is prevented by crushing the vessel mouths with forceps rather than ligating or suturing. The nature of the ground for the transplant does not seem to be very important except that fresh wounds are not favorable. Quite bare bone or tendon affords good ground as does other dense fibrous tissue. Scar tissue should always be removed freely.

Asepsis is less important. Provided there are no pockets of infection, ordinary disinfection and cleaning with alcohol prevent sepsis. The place from which the graft is taken is determined by its proximity to the part to be covered. Transplanting the flap to an intermediate area and from there, after separation from its base, to the final site, is a resource possible in extraordinary cases. For the size of the flap one rule is important: make it big enough. It will contract about one-third in each direction. The direction of the pedicle is not of great importance. At the second operation it may be necessary to cut the pedicle in two steps to avoid too sudden change in a redundant circulation. The flap is fastened into position with interrupted sutures of linen or silk. The wound from which the graft came is closed by primary suture. Closure of the wound left when the flap is cut loose depends upon circumstances. As the surfaces are not strictly aseptic, secondary suture is appropriate. Dilute alcohol is a good dressing material. The usual time to obtain a "take" is from ten to fourteen days. Cutting the flap loose may be done under local anæsthesia. Usually it is better to fit it into place with the patient under ether. Flap sloughs do not occur and small skin sloughs may be avoided

by not undermining the edge. The flap should be fastened in its prepared bed with its perpendicular edges nicely held with interrupted sutures.

F. W. PINNEO.

Gallie, W. E., Dunn, N., and Smith, A.: Discussion on Bone Grafting. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Surg., 22.

In this discussion Gallie stated that ten days after the implantation of a bone-graft the proliferation of the osteoblasts on both the endosteal and periosteal surfaces is established and excavations are produced in the graft. New blood-vessels are seen in the mouths of the haversian canals, and gradually the osteoblasts and blood-vessels permeate the whole transplant. When boiled bone is employed these changes take place at a definitely slower rate. Autogenous grafts alone guarantee success when there is a gap to be bridged. As living osteoblasts survive only on the surface of the graft, its width should be greater than its thickness. A rib-graft is better than a tibial graft as it is more porous and better supplied with lymph, but it is not so strong as a tibial graft and therefore the latter should be used when strength is required.

According to Dunn, there are two questions which should be answered before resorting to bone grafting: (1) will re-establishment of continuity improve function, and (2) is the use of the bone-graft the best means? When in ununited fractures of the forearm there is ankylosis of the superior or inferior radio-ulnar joints, any movement of pronation and supination at the site of the fracture would be lost if union of the fragments were established. The hand articulates mainly with the radius, and in practically all cases of ununited fracture of the lower two-thirds of the radius a bone-graft will be necessary to give stability to the hand. When the lower fragment of the radius is less than 1 inch in length, shortening of the ulna to correct the radial deviation and allow direct union of the radius gives the best results. Ununited fracture of the lower one-third of the ulna or of the olecranon may, as a rule, be ignored. Often in fracture of the femur the mere freshening of the ends with efficient external fixation gives excellent results. Moderate shortening of the humerus is not a serious disability, and direct apposition of the ends with shortening is to be preferred. When the entire upper fragment is lost, direct fixation to the scapula will give better functional results than the use of a graft.

Success in bone grafting is dependent upon: (1) asepsis, (2) adequate contact of raw surfaces, and (3) efficient fixation. After severe sepsis the wound should be entirely healed for six months. A preliminary excision of scar tissue should then be done which enables the operator to determine the presence of sepsis, removes tissue of low vitality, and allows healthy vascular tissue to surround the graft. The graft should consist of periosteum, cortex, and endosteum and should be strong enough to withstand the strain of function when its union to the fragments is complete. The joints above and below the fracture should be controlled, but movement of the digits encouraged. The graft should fit tightly in the bed prepared for it, and should be held firmly in place with kangaroo tendon. After hæmostasis is complete, the wound is closed with both superficial and deep sutures with drainage tubes of rubber which are left in place for forty-eight hours.

In 75 cases, fracture of the tibia from which the graft was removed occurred in 2, in one instance six weeks after the operation, and in the other, two months later. As a rule, an X-ray taken three months after the removal of a graft will show no loss of density of the bone.

Smith stated that it is to be expected that more consistant results are to be had in the young than in the middle-aged and in the simple ununited than in compound fractures which call for the bone-graft. Operation should not be performed in any septic case unless:

1. The discharging wounds have been healed for from nine to twelve months. During this period treatment should consist of immobilization, massage, passive congestion, and percussion by means of a wooden hammer on the region of the fracture.

2. A preliminary operation for the removal of the scar has been performed. In cases which have been healed for months small sequestra and encapsulated abscesses have been found.

3. A course of provocative massage of a month's duration has been instituted and has not been followed by a flare-up.

4. The wound can be covered with healthy skin without tension. In such cases pedunculated skin flaps may be implanted as a preliminary operation.

From the operative standpoint the following points are of importance: (1) perfect asepsis, (2) perfect hæmostasis, (3) close coaptation between the host and graft, (4) rigid fixation of the graft to the bone, and (5) rigid immobilization of the limb for at least twice as long as in ordinary fracture, though massage and active movement of the muscles may be begun early.

P. W. SWEET.

Osgood, R. B.: Gunshot Injuries to the Joints. *J. Orthop. Surg.*, 1919, i, 304.

The essentials in the treatment of gunshot injuries of joints seem to be the following, given in the order of their importance.

1. Fixation and traction provided at the earliest possible moment by thoroughly efficient splints and continued in transport till a hospital is reached at which the patient may remain until convalescence from a possible operation is sufficiently well advanced to allow safe further transport (in all probability two or three weeks).

2. Early careful examination, radiographic, bacteriological, and clinical, at the earliest possible moment after the injury. This examination must

be carried out by a specially trained surgeon capable of operating skillfully and at once, and at a well-equipped hospital, not far from the line, where the patient may remain under the close observation of this surgeon or his qualified assistants until convalescence is well established.

3. Primary, delayed primary, or secondary closure of the wound in all operative cases by a special technique now sufficiently well established to be regularly followed, and which in the secondary closures involves a thorough knowledge of the Carrel-Dakin method.

4. After-treatment to assure most perfect function, consisting of early active motion. Later massage, possibly electrical and hydrotherapeutic treatment, often in conjunction with special orthopedic apparatus, and curative occupational therapy. V. C. DAVID.

Everidge, J.: A New Method of Treatment for Suppurative Arthritis of the Knee-Joint. *Brit. J. Surg.*, 1919, vi, 566.

Current methods of treatment, such as various types of drainage and chemical methods with prolonged immobilization in the suppurative cases, have marked disadvantages the chief of which is that during prolonged rest the limb suffers muscular atrophy and is largely deprived of its blood supply. This is partly due to the lack of muscular action to promote the flow of blood in the veins. Tracking sepsis may occur when the main artery has been ligated. These facts are sufficient to warrant reconsideration of the advisability of complete rest in suppurative arthritis of the knee.

The author has endeavored to evolve a method of treatment which aids the natural powers of resisting infection to the utmost. This method, which he calls the "physiological method," relies upon active movements of the joints of the lower extremity including the knee, combined with adequate openings into the infected joint to allow the free escape of synovia and pus which otherwise would be disseminated by the movements. Active movements are begun soon after operation. The patients coöperate better when shown that, coincident with the visible escape of pus from the joint, the movements alleviate the pain.

The method described has five advantages which may be summarized as follows: (1) it hastens repair by preserving a good blood supply to the tissues of the joint; (2) aids drainage; (3) prevents extreme atrophy of the muscles so that they may better resume function; (4) establishes a process of auto-vaccination; and (5) realizes the possibilities of a subsequently mobile joint. Experience has shown, however, that this treatment is not advisable in cases of gross injury to the articular bone, essential tendons, or ligaments, or when suppuration has gone on for sixteen days or more.

Bacterial invasion of the joint cannot be determined early by examining the fluid, although usually evidence of soiling may be obtained. Cultures are positive and give evidence either of a clearing up of the infection when the toilet operation is successful or a multiplication of organisms up to about the sixth day when symptoms of infection arise. A preponderance of leucocytes is not pathognomonic of severe septic infection, but 80 per cent of polynuclears in a differential count marks roughly the dividing line between a good and bad prognosis. Extracellular organisms and the absence of phagocytosis when suppuration has lasted for ten days point to a severe infection and limitation of the power of resistance.

During the developing stage there is first a discolored synovial fluid, due to altered blood, followed by albuminous fluid like coagulating white of egg, and then a seropurulent fluid. Established suppuration shows pus which in staphylococcal infection is thick and creamy and in streptococcal infection thinner and less viscid.

During subsidence there may be pus with semi-solid curd, curds floating in a clearer fluid, and last, synovia, clear and limpid. In the last stages, partial or complete secondary suture may be done unless there is necrosis of the bone.

The only three tissues present in the joint to react are the synovial membrane, the synovial fluid, and the cartilage. The author concludes that the synovial fluid must be the most valuable germicidal agent. Its action depends, he believes, upon the blood supply and its flushing action. The flushing action and avoidance of stagnation are of great importance in the natural recovery. Thus the removal of stagnating synovial fluid may be the potent factor in the treatment by paracentesis followed by the injection of an antiseptic fluid referred to by Lockwood.

In penetrating injuries of the joint, the percentages of soiling are given usually as between 70 and 80 per cent. When a foreign body is lodged in the joint, organisms have been introduced. However, after removal of the foreign body and a joint toilet, treatment has failed in only about 20 to 30 per cent of the cases.

The details of the physiological method are as follows: A parapatellar incision is avoided because it causes wide gaping of the skin and slow healing; the joint openings tend to close early as the split muscle and tendon fibers fall together; it interferes with the blood supply which goes transversely to the joint; hæmorrhages may occur; and in case of amputation the anterior flap is interfered with. The author, therefore, uses transverse incisions at the inner and outer borders of the patella, beginning at the juncture of the upper and middle thirds of the bone and continuing backward for about 1½ inches. The lateral ligaments lie below and behind this incision. The cut edges of the synovial membrane are then stitched to the skin, a single layer of rubber tissue being inserted between the lips and left in place for twenty-four hours. When the edges do not retract sufficiently, an elliptical segment is excised.

To aid these patients in moving their knees an apparatus is used. Gravity is eliminated by means of a hinged rolling splint suspended by carefully controlled weights attached through pulleys.

The physiological method must be instituted early at the first signs of sepsis. The author believes it unwise to resort to arthrotomy, lavage, and closure when sepsis occurs as late as a week after the original wound or primary operation. At this time this treatment would be useless and would simply increase the dangers and decrease the chances of obtaining a good result.

If in the virulent types of inflammation the movements become restricted and painful toward the end of the third week, it may be due to a collection of pus in the popliteal space or an erosion of the articular cartilages. If the latter has occurred, a Thomas splint should be applied and the hope of obtaining a mobile knee given up.

A useful mobile joint resulted in about 50 per cent of the cases treated. The method is impracticable if its adoption is delayed until the fulminating stage of suppurative arthritis. G. L. McWHORTER.

ORTHOPEDICS IN GENERAL

Sherwood, W. A., and Jones, M. L.: Back Pain in the Military Service. *J. Am. M. Ass.*, 1919, lxxii, 1599.

The authors give a classification of the causes of back pains as observed in military service, basing their study on 139 cases. They emphasize that in most cases thoroughness and group coöperation are needed to arrive at correct conclusions.

In a surprisingly large number of instances, the X-ray has revealed slight rotations and dislocations as causes of back pains.

Sacro-iliac pathology may be divided into infections and conditions due to mechanical causes. Dislocations or slips are relatively common. In such cases the patient gives a history of recurrent attacks of pain in the back after lifting, usually while stooping. There is spasm of the lumbar muscles and often a tilting of the pelvis to the affected side. Flexion of the thigh on the abdomen causes pain. Rectal examination reveals tenderness over the joint, but pain on compression of the pelvis is rare. A striking sign is tenderness over the symphysis, and a chief roentgen finding is misalignment of the symphysis. The authors' treatment consists of rest, adhesive strapping of special design, and belts. Manipulations have not been successful.

Tuberculosis was fairly common in both old healed and acute cases. K. L. VEHE.

Marshall, H.: Case of Back Strain Causing Acute Retention of Urine; with a Brief Discussion of Various Phases in the Diagnosis and Treatment of Lesions of the Lower Region of the Spine. *Boston M. & S. J.*, 1919, clxxx, 545.

Back strain may be due to strain of the sacrosciatic ligament which can be felt by palpating with the fingers deeply through the skin and overlying muscles; the posterior sacro-iliac ligaments, the deeply located ligaments at the lumbosacral juncture and higher up, and the very important common spinal ligaments which run along the anterior side of the vertebral body. Stretched ligaments may recover their strength to the extent that they are able to take care of increased strain without trouble, although they never regain their previous tone and shortness.

Soreness in the back is often attributed also to strain of the muscles, especially at their place of origin or insertion. Less frequently the cause is myositis.

Slipping sensations of the back frequently are interpreted as very slight slippings of the sacro-iliac joints, but in spite of many explanations are not anatomically established.

At times pain is referred to the lumbosacral or gluteal region, and may be felt down the posterior and outer edges of the thighs, even to the calves of the legs. Usually through the legs and hips it is unilateral. This is a reflex sensation of visceral origin caused by disturbance of the pelvic organs.

The explanation that neuralgic pain is due to direct stretching of the nerve of the plexus holds good only in exceptional cases. More often the cause is mechanical pressure as when inflammation and swelling of the iliopsoas muscle presses upon the lumbar plexus. The sympathetic nerve and sympathetic ganglionated cord in the lumbar and sacral regions of the spine also may be involved. At the lumbosacral juncture the sympathetic nerves run in front of the vertebral bodies and are exposed to unusual stretching.

In hypertrophic arthritis of the spine numerous instances of involvement of the ligaments on the anterior side of the lumbar vertebræ in degenerative processes of calcification are observed.

Partly degenerated fibrous attachments are apt to rupture and produce œdematous swelling.

Attention was first called to the relation of the vertebral anomalies and symptoms of the back by Goldthwait, who suggested the possibility of contact between the long transverse process of the fifth lumbar vertebra with the iliac bone in cases of sagging back. Occasionally this condition has been observed in anatomical specimens.

In interpreting X-ray pictures it must be remembered that apparent overlapping does not always mean impingement, as stereoscopic pictures often show that in such cases there is no actual contact.

Many persons have vertebral anomalies without any pathologic symptoms. At times, however, variations in the curves of the spine may have some direct bearing on serious back complaints. Extreme lumbar curves show that the spine has sagged.

Sacro-iliac displacements occur in demonstrable degrees only in most exceptional cases. Slight slipping can be neither proved nor disproved.

The writer reports one case in which there were bladder symptoms following back sprain on the

anterior side of the spine. These were due to pressure upon the nerves running to the bladder.

The author does not go into the details of treatment of these various conditions other than to mention the general methods now in use, such as strappings, exercise, jackets, and general hygienic measures. ARTHUR STEINDLER.

Hurst, A. F.: War Contractures—Localized Tetanus, Reflex Disorder, or Tetanus. *Brit. J. Surg.*, 1919, vi, 579.

In the early stages the diagnosis between localized tetanus and hysterical spasm may be extremely difficult. If the contractures persist without abating for more than three or four weeks and do not disappear completely at the end of six or eight weeks, they are probably hysterical, even if at first they were due to tetanus. Spasms which begin immediately after the wound is inflicted cannot be due to tetanus; generally they are reflex and protective in nature, but are often maintained after the first few hours or days by autosuggestion.

A later onset is compatible with tetanus as well as hysteria and in both the extent of the contractures is often out of all proportion to the size of the wound. If the contracture persists in sleep, hysteria can be excluded. A general anæsthetic causes hysterical contractures to disappear more rapidly than tetanic contractures which persist to some extent even under deep anæsthesia. Hysterical contractures, however, may also continue after consciousness is lost.

If the muscles are of a wooden and unvarying hardness, tetanus is almost certainly present. An increase in the size of the muscle, possibly due to obstruction of its lymphatic vessels, without tenderness or subcutaneous œdema, is conclusive evidence in favor of local tetanus. The continued tonic contraction in tetanus is generally accompanied by spasmodic and more or less painful contractions which are often brought on by external stimuli.

Froment and Babinski believe that many of the contractures which have hitherto been regarded as hysterical or due to some obscure condition such as an ascending neuritis, as held by Tinel, are really reflex in origin. While this theory at first seems to offer a satisfactory explanation of many cases the nature of which is obscure, Hurst does not agree with it.

There is no doubt that reflex contraction of the neighboring muscles is not uncommon immediately after a wound is inflicted, the reflex being protective in nature. When the symptom persists after the wound is healed, it is no longer due to reflex action, but is the result of suggestion. The contracture is thus primarily reflex and subsequently hysterical. If a hysterical condition is not diagnosed, the patient will receive treatment for a long time for localized tetanus or reflex symptoms and will lose the value of psychotherapy.

The posture in hysterical contractures is identical with that which existed at the time the contractures developed, and in many cases is that which was assumed immediately after the injury. Thus, if one or more peripheral nerves were damaged, the position corresponds with the position which would result from paralysis or occasionally from irritation of these nerves.

In such cases, when the nerve recovers from the effect of the injury, whether within a few hours, a few weeks, or months, the abnormal posture and the inability to move are maintained as a result of suggestion. In other cases the injury may lead to reflex spasm of the neighboring muscles and inhibition of movement of the whole limb which is protective in nature and rapidly disappears as the condition of the wound improves.

The patient more or less subconsciously assumes the position which gives most relief from the pain. He does not realize that the absence of voluntary effort on his part was to save him from pain, but believes that it was due to paralysis as the direct result of his injury.

Histories are presented illustrating all points discussed by the author, as well as the positions of the joints assumed in hysteria.

In many cases of hysteria the posture is that in which the surgeon fixed the limb by means of splints or bandages when it was first dressed. The patient becomes so accustomed to the immobility of the joint that when the splint or bandage is removed, he fails to realize that there is nothing to prevent the return of the normal functional activity. He makes a feeble effort to bend the joint, finds that it produces pain without any resulting movement, and gives up the attempt in despair, reconciling himself to the notion that the joint has become fixed as a result of the operation and that no voluntary effort will have any effect upon it. A little manipulation, accompanied by a few words of explanation, would at this stage dispel the erroneous idea in five minutes and the patient would be spared months of disability.

The development of hysterical contracture and associated paralysis is due to the fact that the patient fails to realize that there is no reason why the spasm should not relax and the power of movement return when the primary factor, nerve injury, protective reflex, conscious or subconscious antalgic spasm and inhibition of movement, localized tetanus, or fixation by splints, is no longer operative.

The patient regards the contracture and inability to move as direct results of his injury, and ignores the intermediate cause, the pain or tetanus. If it had been pointed out to him, when the pain was disappearing, that his incapacity was due to the pain and only indirectly to the injury, and that there was therefore no longer any reason why the incapacity should be maintained, he would have made the necessary effort and the hysterical condition would never have developed. Hysterical contractures and paralysis may result from injuries to the soft parts of the limb, with or without involvement of the bones and joints. Contractures

and paralysis of the same nature have been observed in fractures, dislocations, sprains, and contusions, when actual wounds were absent.

The normal circulation through a limb depends upon its active movements, the afferent nerve fibers from the muscles probably giving rise to localized reflex vasodilatation. If for any reason the arm is not moved in cold weather, the hand becomes shriveled, white or blue, numb, painful, and stiff. These well-recognized changes disappear at once with active exercise and warming of the limb, both of which restore the circulation. The tendency to disturbances of this kind is much greater in persons with poor circulation than in those with naturally good circulation. The immobility caused by paralysis or contracture of a limb, whether organic or hysterical, results in deficient circulation and the same secondary changes.

When the venous and lymphatic stasis is very marked, and the paralysis absolutely complete, œdema may occur, especially if the paralysis is accompanied by contracture in a position in which the veins and lymphatics are obstructed by the rigid muscles. The deficient circulation results in changes in the physiological properties of the paralyzed muscles, even if the paralysis is entirely hysterical. When the hysterical contractions are cured, circulation improves and the parts gradually return to the normal.

In breaking up hysterical joints the soft parts of the normal joint are often torn instead of the adhesions and effusion results. Hysterical contractures disappear only after deep anæsthesia. Violent movements with incomplete anæsthesia may thus result in the tearing of contracted but otherwise normal muscle fibers and normal fibrous tissue.

Anæsthesia due to cold if often repeated may become hysterical in nature by autosuggestion. This anæsthesia may be so complete that trophic ulcers may follow.

In hysterical contractures the X-rays show abnormal transparency of the bones, which apparently is due partly to deficient calcification and partly to absorption of the bony tissue. No definite alteration in the outline of the bones, however, has been observed. Although the joints occasionally appear to be enlarged, the X-rays show no change in the articular surface. This is consistent with the fact that hysterical disorders of joints never give rise to anatomical change as the result of pressure exerted on abnormal surfaces, however long the condition may persist. The enlargement of the joint may be due partly to œdema from deficient circulation, but is more often simply apparent and due to atrophy of the soft parts around the shafts of the bones. The nails become thin, brittle, and abnormally opaque, and in many cases show longitudinal grooves.

The excessive sweating which often occurs in these cases is more difficult to explain. It may be in part a direct result of the cutaneous asphyxia when the circulation is unusually feeble. In cases of contracture in which the hand is tightly flexed, it is due in part to the fact that the air in contact with the palm is kept warmer than that in contact with the palm of the normal hand and evaporation which occurs in the enclosed space formed by the clenched hand is diminished. It is possible that the intense nerve impulses sent down from the brain to the centers in the spinal cord spread from the motor nerve-cells to the neighboring sympathetic nerve-cells which control the secretion of sweat. This would explain the fact that the sweating may occur also, though to a less extent, in the normal hand.

When hysterical paralysis, with or without contracture, has persisted for some months and psychotherapy leads to rapid recovery, it is often observed that although the patient is able to perform every movement in a perfectly normal way at the end of perhaps an hour, he tends to maintain the abnormal posture due to the paralysis and contracture as soon as his attention is withdrawn from the affected limb. Another striking fact in these conditions is the maintenance of the abnormal posture of the arm or leg during sleep. Hysterical contractures disappear during sleep, but in spite of this the abnormal posture is maintained, so that it is only by manipulating the limb that the absence of the spasm of the affected muscles can be demonstrated.

The diagnosis of a hysterical contracture depends primarily upon the incompatibility of the symptoms with the injury. An injury to a nerve cannot account for persistent spasm of the muscles it supplies and still less for that of other muscles. Persistent muscular spasm resulting from injuries is thus invariably hysterical unless the pyramidal tracts in the brain or spinal cord have been directly damaged.

If the posture is due to the perpetuation by suggestion of a position which developed under circumstances which placed the limb into a position the patient could not voluntarily assume, its maintenance for a more or less prolonged period before the responsible circumstances cease to be operative would be sufficient to train the muscles involved to continue to act in the same way. It would also lead to the development of postural lengths of the muscles which would help to keep the part in the abnormal position even after psychotherapy had resulted in a cure of the contracture and paralysis.

Treatment begins with a full explanation of the cause of the symptoms in language suited to the patient's intelligence and degree of education, followed by persuasion and re-education combined in most cases with manipulation, which doubtless acts to some extent by suggestion. A very important, but by no means essential, preliminary is the creation of a proper atmosphere of cure. The patient is made to understand that any treatment he has already received has prepared the way so that nothing now remains but a properly directed effort on his part, with the physician's help, for complete recovery. During the whole course of treatment he

is engaged in conversation and the meaning of each successive step is carefully explained. He is made to watch the contractions of the muscles and the play of the tendons of the normal limb and to attempt to imitate them in the affected one. In some cases it is not even necessary to touch the patient, mere explanation and persuasion being sufficient to cause him to relax any spasm which may be present, and then to perform the various movements of the part with quickly increasing strength and rapidity.

When very great difficulty is experienced in getting the contracted muscles to relax, the limb should be placed in very hot water and the manipulations carried out when the circulation has been artificially improved in this way. Some relaxation always occurs because the rigidity is in part the direct result of the deficient blood supply. Passive movements are most effective if carried out by the medical officer himself while the patient is engaged in conversation the whole time and made to take an active part in the movements from a very early stage in the first sitting. For this reason the author never employs the mechanical appliances for performing passive movements which have been so frequently advocated. L. C. DONNELLY.

Morton, W. C.: The Treatment of Functional Disability of the Limbs in a Special Military Surgical Hospital. *Brit. J. Surg.*, 1919, vi, 497.

The author gives full reports of 44 cases of functional disability, illustrating them with photographs.

Each patient is examined for the first time privately and no one is treated in such a way as to lead him to believe that his disability is not regarded as a very real condition.

After he has explained what he cannot do, he is asked about occurrences previous or subsequent to the development of the disability which might have some bearing on the case. The limb is then examined for œdema, scars, deformities, abnormal posture, involuntary movements, etc. The movements which the patient cannot execute voluntarily in a perfectly normal manner are noted. In every case the whole limb is examined as, in drop-foot for example, both the leg and the thigh may be involved and weakness of abduction at the hip-joint may have caused the pelvis to drop to the opposite side. The muscles not functioning properly are noted and the attention is directed to their condition both when the patient is at rest and when he is attempting movements.

In arriving at a diagnosis it is determined how much of the trouble is organic and whether there is or has been any direct injury to the muscles themselves, the bones upon which they are intended to act, or the upper or lower neurones by which they should be controlled. It is borne in mind also that the condition may be due to such a lowering of the tone of the whole muscular system that the muscles which have been subjected to the greatest strain in the course of evolution (for example, the peronei or the abductors of the hip) can no longer "carry on." It is remembered also that there may be indirect organic trouble, a painful or protective reflex causing spasm, or an œdema which hampers the muscles partly by causing faulty nutrition and elimination of by-products and partly by thickening and stiffening the muscles themselves. Another possibility is that the muscles may have been so long out of use that their sensory mechanism is out of order. In some cases the condition may be traced to an alteration in the equilibrium of the body due to the shortening of a limb which causes a pelvic drop and scoliosis or an injury which results in scoliosis followed by pelvic uptilt and an apparent shortening of a limb. In other instances a loss of the normal muscular antagonism through a direct injury of the antagonists and their nerves may be responsible.

In every case the facts and difficulties are carefully explained to the patient. If any part of the disability is incurable, he is frankly told so. The rest of the trouble he is told is due to the muscle habit and is curable. As far as possible he is informed how long it will take to cure him—whether one lesson will be sufficient, one day, one week, or one or more months. Emphasis, however, is laid on the fact that a great deal depends upon his own efforts.

Although the methods of treatment vary according to the nature and site of the disability, they are all based upon the same principles, i.e., stimulation of the muscular sense, restoration of the reciprocal action of the antagonists, and co-ordination of all of the muscles under the perfect control of an educated nervous system. Each muscle must be taught to function properly, to contract and relax at will, and by acting at the proper moment with the proper degree of force, to secure complete co-ordination. L. C. DONNELLY.

SURGERY OF THE SPINAL COLUMN AND CORD

Sauvé, L.: Six Secondary Laminectomies for War Wounds (Six cas de laminectomies secondaries pour blessures de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 804.

The author gives the clinical histories of 6 cases in 5 of which the presence of a projectile in the spinal column caused more or less serious complications which rendered extraction necessary. In the remaining case a laminectomy was required because of a spinal fracture which caused the phenomena of compression of the spinal cord.

The 6 cases of laminectomy ended in recovery although in 3 of them it was necessary to open the subarachnoid space. In some instances the im-

provement was observed very soon after the operation.

In all of the cases reported Sauvé combined laminectomy with extraction of the projectile under the intermittent control of the radioscopic screen. This method always enabled him to extract the projectile through the smallest possible opening in the spinal column which gave access to the canal. In the majority of cases it enabled him to limit the operation to a hemi-laminectomy which, while giving sufficient opening for the extraction of the projectile, was rapidly executed and did not injure the solidity of the column.

In all of the laminectomies Sauvé opened the canal by means of the gouge. The use of the chisel and mallet he believes may cause medullary contusion. The dura was closed without drainage and in no case was a postoperative fistula observed.

W. A. BRENNAN.

Thorburn, W., and Richardson, G.: The Pathology of Gunshot Wounds of the Spine and Spinal Cord. *Brit. J. Surg.*, 1919, vi, 481.

This article is based upon autopsies and operations performed in various theaters of war. The dried specimens have been forwarded to the museum of the Royal College of Surgeons of England.

All of the observations were made at advanced bases, a French seaport, Salonika, Mudros, and Malta, and a very few in England, a fact which means that the authors saw few of the most seriously injured patients who died before reaching the base and a fewer number of those who were slightly injured and evacuated to England. The operations were performed in only a selected number of cases.

In civil life, fracture of one or more vertebræ with displacement of the whole column is common. The specimens here reported showed few in which the body was seriously involved. Injuries from direct impact were also few, but may have been observed more frequently at the casualty clearing stations.

There was a wide distribution of fractures through several vertebræ, and remote fractures were numerous. This may have been due to the tearing off of the bony prominences by the traction of a muscle or tendon.

Two chief types of fracture were found, one of them due to crushing and perforation, and the other a fissured fracture with clean cracks. Fractures of the laminæ were often associated with a second fracture of the bony ring, usually nearly opposite.

Foreign bodies were found frequently in the bodies of the vertebræ or inside the vertebral canal. In many instances it was possible to trace the track of the missile by the minute fragments seen by roentgenography. In some cases the foreign bodies had slipped down inside the theca.

The authors have classified these injuries according to the angle at which the missile struck the spine and whether it passed through the spine or not. This classification is as follows:

1a. Cases of fracture by direct impact with retention of the missile in the spine. The fractures were of all degrees, but there was no relation between the severity of the fracture and the injury to the spinal cord.

1b. Cases of fracture by direct impact with complete perforation of the spine. In some instances the injury was very slight while in others it was severe, with marked damage to the bone.

2. Cases in which there had been a tangential blow upon the spine and in which as a rule the vertebral column was not penetrated either by the missile or the fragments of bone. Although the spinal cord was destroyed or nearly so in the cases reported, the theca was not necessarily injured. Frequently when the tangential blow had approached the vertical rather than the horizontal direction, many vertebræ were injured while the cord injuries varied.

As a rule the spinal meninges were untorn unless they had been subjected to direct impact, even when the spinal cord was fatally injured, a condition analogous to that observed in accidents occurring in civil life.

The meninges were very resistent to infection from without. Hæmorrhages were found commonly around the meninges and in a few instances had produced a cicatrix with pressure upon the cord. No hæmorrhages had occurred within the cord.

Some of the specimens illustrated how seriously the cord may be injured when there is only a slight osseous lesion. In the cases reported of a type which are often spoken of vaguely as due to "concussion" of the cord, it was evident that the bruising and hæmorrhage were not always due to osseous displacement, whether with or without recoil. In the author's opinion, such a condition more often resulted from the general disruptive or divulsive wave which is characteristic of gunshot injuries in all regions. The appearance was uniform and similar to that produced by direct crushing of the spinal cord. Serial sections showed a spindle-shaped area of petechial hæmorrhage with necrosis, tapering above and below the point of impact or the divulsive wave. The destruction was more marked in the gray matter than in the firmer white fibers. A certain amount of œdema was found around the hæmorrhages, especially in the axis cylinders, and associated with Nissl degeneration of the anterior cornual cells. Intraradicular hæmorrhages were also present.

No reparative changes were observed even in the body of one patient who survived for twenty-seven days.

The authors conclude that the changes described resulting from the impact of the disruptive wave of a gunshot injury are all contusions of the cord. While they are sometimes spoken of as due to "concussion," they have nothing in common with

cases in which there is a generalized rather than a local effect. The slightly injured patients of course did not die from the cord lesion, and the authors can surmise only that the changes were due to minute hæmorrhages from the divulsive wave. In the case of one patient who died from other causes a small hæmorrhage was found in the posterior root after symptoms of numbness in the arm which were diagnosed as due to concussion.

G. L. McWhorter.

SURGERY OF THE NERVOUS SYSTEM

Corner, E. M.: Abstract of the Harveian Lecture on Nerves in Amputation Stumps. *Brit. M. J.*, 1919, i, 638.

Nerves as contrasted with other structures are known to have the power of regeneration. In amputation, the nerve-growth is abnormal, invading tendons, muscles, infected clots, blood-vessels and bone like a malignant tumor and defeating all methods devised to arrest it. Nerves apparently grow through muscle easily and through connective tissue poorly.

The immediate pain after an amputation is due to injuries of the nerves during the operation and passes away in a few days. The early pain after an amputation is due to the participation of their ends in the general repair of the wound. If the wound is infected, neuritis may result. This may be prevented by cutting the nerves short, closing their mouths, and avoiding all unnecesary handling and manipulation.

The causation of remote pain is more complex. Three factors are now known:

1. Inflammation due to infection and the resulting development of islands of fibrous tissue within the nerve. Cultures have been obtained three years after complete healing of a wound.
2. The presence of foreign bodies such as metal, silk, and fibrous tissue.
3. The mental factor.

Three rules of practical value to prevent remote pain are: (1) do not use silk in infected wounds; (2) do not keep patients together in homes and hospitals longer than necessary; and (3) get patients back to some kind of work.

G. L. McWhorter.

Dales, J. A.: Plastic Surgery of Peripheral Nerves. *J. Iowa M. Soc.*, 1919, ix, 155.

The author first reviews the structure and function of the peripheral nerves. In the diagnosis of a nerve lesion a careful history and examination, including the response to electric stimuli, are necessary.

There are four surgical lesions of nerves. First, involvement of the nerve in a cicatrix of surrounding tissues; second, partial severance by a bullet or instrument; third, puncture wounds of large nerve trunks by missiles; and fourth, complete severance.

Operation is indicated when there is complete division of the nerve, when the nerve function is injured and repair is arrested, and when there is severe neuralgic pain. Early operation is indicated except in the presence of infection. The best results in restoring a severed nerve are offered by direct union.

I. E. Bishkow.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSES, ETC.

Erlanger, J., and Gasser, H. S.: Hypertonic Gum Acacia and Glucose in the Treatment of Secondary Traumatic Shock. *Ann. Surg.*, 1919, lxix, 389.

The authors have made an exhaustive experimental study of shock both in animals and man. From a review of their methods of producing shock it would seem that retarding the circulation in all, or the greater part, of the body is the factor which leads to the development of experimental shock. A study of the blood-volume of animals in shock shows that, regardless of the method by which the shock has been produced, the blood-plasma shows a depletion of about 20.3 per cent. These results confirm the well-known fact that little blood can be obtained from an animal in shock. The reserve alkalinity, as indicated by the CO_2 in the plasma of the arterial blood, is reduced in all types of shock, but the reduction is extremely variable. Acidosis, therefore, though probably always present to some degree, can scarcely be regarded as an essential feature in the shock complex.

The necropsies made upon the animals used in the shock experiments invariably showed upon microscopic examination of the intestines that the capillaries and venules of the villi were tremendously distended by solid masses of red corpuscles. Therefore as a result of the slowing of the blood-stream it is probable that the corpuscles, by clumping in the venules and capillaries, choke and dilate them. This in turn still further curtails the blood-flow until the processes of tissue reparation and nutrition may be seriously interfered with. The effective blood-volume is further reduced by the transudation of plasma. Largely, if not exclusively due to the

deficient general circulation resulting from the reduction in the effective blood-volume, the medullary centers, including the vasomotor centers, and the heart, eventually show signs of functional insufficiency.

While making estimations of the blood-volume in shock by the acacia method, it was observed that the concentration of the blood which ordinarily occurs during the development of shock was not nearly as marked in animals that had received a preliminary dose of 20 per cent gum acacia. Woodyatt and others have shown that hypertonic glucose when given at a subtolerant rate to persons desperately ill has a beneficial action. This also applies to shock.

Theoretically, at least, the administration of a combination of hypertonic gum acacia and hypertonic glucose acts beneficially in several ways: (1) by drawing fluids from the tissues into the bloodstream, thus assisting the normal mechanism in restoring the blood-volume; (2) by maintaining this increased volume through some specific action of gum acacia; (3) by dilating the arterioles through some specific action of the hypertonic crystalloid; (4) by increasing the energy of the heart-beat in the same way, and also by the direct action of the glucose on the muscle; and (5) by augmenting the metabolism through the increase in the supply of glucose to the organism between the limits of basal metabolism and self regulation.

Clinical observations in the treatment of shock-like states in man seem to bear out these theoretical contentions although interpretation is more difficult than in animal experiments. It has been conclusively shown that the same solution when used in man is at least innocuous and the results are strongly suggestive. GATEWOOD.

DuBois, E. F.: The Basal Metabolism as a Guide in the Diagnosis and Treatment of Thyroid Disease. *Med. Clin. N. Am.*, 1919, ii, 1201.

There is only one test that stands out as a rational measure of the degree of hyperthyroidism, and that is the measurement of the basal metabolism.

The basal metabolism of a man is represented by the number of calories he produces in the morning hours, before breakfast, while resting quietly in bed. Usually this is expressed in terms of calories per hour per square meter of body surface. The study of a large number of normal men and women has shown that the level of basal metabolism varies with age, sex, and surface area. There are comparatively few normal persons whose basal metabolism figures are more than 10 per cent above or below the average.

The basal metabolism of patients with high fever is 30 to 40 per cent higher than normal. Also in severe cardiac disease, renal disease, and anæmia it may be high, and in leukæmias with high white-cell counts the heat production may be almost double that of the normal. It is in hyperthyroidism that we find the highest basal metabolism, and there is a striking parallelism between the severity of the disease and the production of heat. In very severe cases the increase is more than 75 per cent. Conversely, in cretinism and myxœdema the metabolism may be 20 to 40 per cent below normal.

An increased basal metabolism is not pathognomonic of hyperthyroidism, but when taken in conjunction with some of the other symptoms it makes the diagnosis certain, and by watching the fluctuations in the basal metabolism the course of the disease may be followed.

The author presents the metabolism readings of a number of patients made when they were first examined and later after ligation of the thyroid arteries. Under ordinary conditions about three quarters of the heat produced is lost by radiation and conduction from the surface of the body and about one quarter by the evaporation of water from the skin and lungs. Therefore, the increased heat production in hyperthyroidism manifests itself in a warm skin which breaks out into a sweat on slight provocation. To supply all this extra heat large quantities of food are necessary.

The metabolism test has a firm physiological and and pathological basis. It is purely objective and cannot be influenced by the hopes of the patient or physician. Since the phenomenon was first discovered by Friedrich Mueller in 1893 and confirmed two years later by Magnus-Levy, its significance has not been disputed, although it has been grossly ignored. V. C. HUNT.

Burman, C. F.: The Treatment of Hodgkin's Disease. *Surg., Gynec. & Obst.*, 1919, xxviii, 440.

Without treatment all recorded cases of Hodgkin's disease have ended in death. There is no authentic report of a spontaneous cure.

Exact diagnosis is necessary for adequate treatment, and such diagnosis rests on the X-ray, blood, and tissue examinations as well as a careful physical examination. In the advanced stages the tissue examination is the most reliable single criterion. In early lesions it may be impossible to distinguish between lymphosarcoma, Hodgkin's disease, simple hyperplasia, and tuberculosis. The author advocates the removal of at least two isolated glands. X-ray examinations are indispensible in determining the presence of mediastinal and chest involvement.

The medicinal treatment of Hodgkin's disease is most unsatisfactory. While under the influence of Bunting and Yates there has been a revival in favor of the surgical removal of Hodgkin's glands, the author feels that the more satisfactory results are due to the X-ray treatment given in conjunction with the operative methods.

The X-ray has a very beneficial effect in ameliorating constitutional symptoms and reducing the tumor, but few, if any, authentic cures by this method are on record.

The author has made use of radium, combining it in some cases with rest in bed, forced feeding, and iron.

Better results are obtained when the tissue examination shows lymphosarcoma than when it shows Hodgkin's disease, and in Hodgkin's disease when polymorphonuclear leucocytosis is not present. Chronic cases are more favorable than acute cases. Intensive prolonged exposures, which are very satisfactory in chronic cases, are quite unsuitable in acute cases. Heavy exposures in acute Hodgkin's disease are usually followed by rapid reduction in the size of the gland masses, but no corresponding improvement in the blood or the patient's general condition. Acute cases treated more than one and one-half years with the heavy-dose method were fatal, with one exception. In chronic cases rest and abundant feeding are of great importance. The most unsatisfactory chronic cases are those with very little glandular enlargement and marked constitutional symptoms and changes in the blood. When the infection is limited to isolated groups of glands, complete disappearance of the glands can be looked for. In chronic Hodgkin's disease the disappearance of the gland masses is almost always accompanied by improvement in health.

The treatment must be so planned that adequate radiation will be applied to all parts of the body affected by the disease, injury to normal structures being avoided and the dose being regulated to the individual case.

The author states that with further improvement in the methods of treatment we may confidently look for permanent cure in an increased proportion of these cases. V. C. HUNT.

Broders, A. C.: Basal-Cell Epithelioma. *J. Am. M. Ass.*, 1919, lxxii, 856.

The cases of basal-cell epithelioma in the series reported represent 13.4 per cent of 2,000 cases of general epithelioma.

Basal and squamous cells can be shown intimately connected in a neoplasm.

It seems to be a well-established fact that a basal-cell epithelioma can change into a squamous-cell epithelioma or at least into an epithelioma in which the squamous cells predominate.

The condition occurs more often in males than in females, the proportion being about three to two in favor of the former. The average age of the patients is 56.7 years. The class of people most often affected are farmers.

A family history of malignancy and a personal history of injury play a negligible part. In 37.1 per cent of the cases there was a previous mole, wart, pimple, eczema, scab, or ulcer.

The duration of the lesion varies from three months to forty-five years, the average being seven years and one month.

It has been found that 96.28 per cent of all the lesions occur above the clavicle.

In the cases reported, 36.19 per cent of the patients had been either operated upon or treated with acids, carbon dioxide, etc., before entering the Mayo Clinic.

In approximately 75 per cent of all the cases treated at the Clinic there was either one excision with the knife alone or one excision with the knife followed immediately by cautery.

Of the 54.1 per cent of patients heard from, 75.86 per cent are living, and of these, 75.45 per cent report a good result.

In the cases in which a good result was reported, 74.68 per cent of the patients had either one excision with the knife alone or one excision with the knife immediately followed by cautery.

The patients who had been treated with acids, carbon dioxide, etc., before entering the Clinic did not obtain as good a result as those who had had no previous treatment.

The low grade of malignancy of the neoplasm is evidenced by its long duration, lack of metastasis in a single case in this series, response to proper surgical treatment, and the fact that 75.45 per cent of the patients reported living have been free from the disease for an average of 6 years, 1.6 months.

Of the patients reported dead, fewer than one-third died from this disease.

The average greatest diameter of the tumors which did not recur after treatment was 1.75 centimeters; of those which showed slight recurrence it was 2 centimeters, and of those not improved by treatment, 3.75 centimeters. In patients known to be dead it was 2.67 centimeters, while in those who died of basal-cell epithelioma it was 4.32 centimeters.

Excessive exposure to sunlight as a cause of the neoplasm has not been borne out by the facts in this series of cases. It was noted that the hand, which is exposed to sunlight at least as much as any part of the body above the clavicles, did not show lesions.

Practically all of the neoplasms in the series reported had their origin in the germinal layer of the epidermis of the skin; only one was demonstrated to have originated from a hair follicle.

BLOOD

Dana, H. W.: Theories Regarding Blood-Pressure. *J. Am. M. Ass.*, 1919, lxxii, 1432.

For a number of years there have appeared from time to time books by various authors purporting to give to the reader a complete understanding of blood-pressure, the causation and the measuring of changes in the various factors, and the blood-pressure conditions to be found in all diseases. Independent observers have also put forth formulæ for the determination of cardiac efficiency by estimations of the blood-pressure.

Recently Dana had the opportunity of studying blood-pressure findings in a large number of army officers and candidates for commissions in the army, chiefly medical officers over 30 years of age. He does not here present statistics as to the distribution of these cases among different age periods,

or as to the classification of the blood-pressure readings obtained, for while these figures might be of interest, such statistics do not help to an understanding of the conditions presented in the individual case. It is his purpose rather to point out some of the conditions met in this mass of material, to discuss the interpretation of the findings, and to suggest a new point of study in the analysis of blood-pressure.

Most of the medical officers examined came to camp from a considerable distance and were examined the day after their arrival without opportunity for rest. Being physicians, they were almost all very nervous over the ordeal of the examination. Most of them were naturally constipated, and this constipation was increased by the journey, the change of routine, and the change of diet. To many, sleep under camp conditions was at first difficult. From all of these causes it was not surprising that a large number of the candidates showed an elevation of the systolic blood-pressure. In a great majority of such cases, however, rest, catharsis, and becoming accustomed to the new routine of life soon brought the blood-pressure down to within normal limits. This observation served to demonstrate in a very striking way the effect of overwork, nervous strain, psychic stimulation, and constipation in raising the blood-pressure.

One fact that impresses the author particularly is the frequency with which a familiar hypertension is observed. Such a condition of continued elevated systolic pressure shared by most members of certain families, a tendency that is apparently hereditary, does not seem in such families to cause invalidism or to shorten life. Indeed, it seems that many such persons continue to have better than normal health and robustness and the hypertension, if not actually the cause of this, at least is associated with their abundance of strength.

Dana states that probably it can be accepted without serious question that the systolic pressure represents the point at which sounds are heard with the stethoscope over the cubital fossa when the pressure in the cuff is dropping, and that the diastolic pressure is the lowest point at which these sounds pass their maximum, i. e., the beginning of the "fourth phase."

The writer argues that the systolic blood-pressure is maintained by vasoconstricting substances in the circulating blood, and an abnormally high blood-pressure indicates that the blood-stream contains either toxic substances (unexcreted products of metabolism or focal purulent processes), or an excessive amount of the vasoconstricting secretion of certain glands of internal secretion. The functional test of cardiac efficiency suggested by the observation of Graupner that when a man has been put through a certain amount of exercise, and when following this his pulse-rate has returned to normal, his systolic blood-pressure as a rule rises, is explained by the theory that there was an increase in the amount of vasoconstricting internal secretion, liberated perhaps by the thyroid or suprarenal glands as a result of the increased circulation following exercise, rather than on the basis of the condition of the heart-muscle.

The more the author has studied blood-pressure, the less convincing to him are the accepted interpretations regarding the test. Certainly while as much respect is shown for blood-pressure reading as ever, the author feels it necessary to get a new conception as to the factors influencing the readings.

From the observations reported the author draws the following conclusions:

1. Increased systolic blood-pressure indicates the presence in the circulating blood of either unexcreted putrefactive products absorbed from the intestine, kidneys, focal infections in the dental alveoli, the nasal sinuses, the tonsils, or the genito-urinary tract, or of secretions in abnormal amounts from the glands of internal secretion.

2. In some cases at least, lowered blood-pressure indicates a defective secretion of pressor substances or an increased secretion of depressor substances by the ductless glands.

3. When the diastolic pressure fails to conform to its normal ratio with the systolic pressure, it is influenced also by abnormal amounts of ductless-gland secretion in the blood-stream.

4. Neither the systolic nor the diastolic blood-pressure gives any certain indication as to the condition of the cardiovascular renal system as such. When changes in the vascular system are accompanied by hypertension neither condition is secondary to the other, both being secondary to the presence of unexcreted toxic products of metabolism in the circulating blood. G. E. BEILBY.

Leyton, O.: Transfusion in Diseases of the Blood
Proc. Roy. Soc. Med., Lond., 1919, xii, Sect. Med., 5

The one hundred transfusions upon which this paper is based were distributed most unevenly among ten patients, one patient having had more than fifty transfusions and two only one transfusion each. After it was found that the donor was free from malaria, syphilis, and tuberculosis, he was deprived of food for six hours previous to the taking of the blood, and the recipient was given a hypodermic of morphine and hyoscine one-half hour before the transfusion was begun. The donor's blood was then prepared with 5 per cent sodium citrate and 0.45 per cent sodium chloride solution. The author favored using the same donor as frequently as possible, and in one instance blood was obtained from the same person six times in three months. His reason for this was that he believes the repeated removal of blood leads to the production of some hormone which stimulates the blood-forming cells and might be useful to the patient suffering from aplastic anæmia. None of the donors suffered any ill effects.

In cases of pernicious anæmia five transfusions usually sufficed to raise the number of red cells from two million to more than three and a half

million. The effects were not permanent, however, and within a few weeks the destruction of the cells had caused a drop to below two million again, when other transfusions were given. It was thought that life could be maintained in a small percentage of cases by repeated transfusions, but in many cases the disease was progressive and the patients continued to grow worse until death finally ensued.

P. W. SWEET.

Kaliski, D. J.: The Use of the Superficial Jugular Veins of the Neck for Intravenous Injections. *J. Am. M. Ass.*, 1919, lxxii, 1613.

While the veins at the bend of the elbow are preferable for intravenous injections, the external jugular of the neck may be used when they are inaccessible. The author has given intravenous treatment hundreds of times into the superficial jugular veins without bad results.

The patient reclines on a level table without a pillow. Compression applied over the clavicle while the skin over the vein is gently drawn toward the chin makes the vein stand out and fixes it so that the needle enters its lumen readily.

The gravity apparatus is best suited for injections into this vein. K. L. VEHE.

Fischer, L.: The Longitudinal Sinus; Its Adaptability in Procuring Blood for Diagnosis; Its Use in the Transfusion of Blood and for Diagnostic Purposes, an Ideal Method in Infancy. *N. York J. Med.*, 1919, xix, 183.

By the use of the longitudinal sinus we have a direct channel through which a small or large quantity of blood can be taken rapidly from or added to the circulation.

Marfan in 1898 first suggested the injection of a saline solution through the anterior fontanel into the longitudinal sinus.

The author uses the longitudinal sinus for every case to the exclusion of all other methods, and finds it adapted for the abstraction of blood as in venesection, for procuring blood for blood cultures and Wassermann tests, for the administration of salvarsan and normal saline, and for the transfusion of blood.

The infant is placed flat on its back on the table and its head steadied by an assistant while the needle is introduced. As the longitudinal sinus is very near the surface, it is rarely necessary to go deeper than 1 or 2 millimeters. The best needle is one-half an inch long, of a 20 or 22 gauge, and has a short bevel point. After it has penetrated the sinus, sufficient blood may be aspirated for diagnostic purposes or the required quantity of blood or medication transfused. V. C. HUNT.

Haessler, H., and Stebbins, M. G.: The Effect of Bile on the Clotting Time of Blood. *J. Exper. M.*, 1919, xxix, 445.

Although it is known that jaundice tends to delay the clotting of blood, the cause of the delay is not known. Minot and his associates, using Howell's method of recalcifying oxalated plasma, found that the coagulation time (prothrombin time of Howell) was increased in a series of jaundice cases, but did not suggest an explanation of the mechanism of the delay. It seemed to the authors of interest, therefore, to determine whether or not the bile and bile salts present in the blood in jaundice are in themselves capable of causing the increase in the coagulation time. The following experiments on cats were therefore undertaken:

Series 1. Cats under ether anæsthesia were bled from a large artery through a paraffined cannula into paraffined 50 cubic centimeter centrifuge tubes containing 7.5 cubic centimeters of 1 per cent sodium oxalate in 0.9 per cent sodium chloride solution. The tubes were then centrifugalized and the plasma carefully pipetted off. If the plasma showed the least trace of hæmolysis it was rejected. A series of flat-bottom tubes, 22 millimeters in diameter and each containing 2 cubic centimeters of plasma and 0.5 cubic centimeter of an ox-bile solution of varying concentration, was then set up. To each of the tubes an amount of calcium chloride was added which previously had been found to produce a firm clot in the minimum length of time with the same plasma.

The time necessary for the formation of a firm clot in each tube was recorded. Precipitation of fibrin was considered complete when a clot of such consistency was formed that the tubes could be inverted without loss of liquid.

Series 2. In these experiments a solution of sodium glycocholate was substituted for the bile. Otherwise, the experiments were identical with those of Series 1.

Series 3. In these experiments 0.5 cubic centimeter of a solution of fibrinogen was used to which bile had been added to the desired concentration. An excess of thrombin was then added and the clotting time noted.

From the above experiments it is evident that, within certain limits, clotting time depends on the percentage of bile present in solution and that the reaction is the same with pure solutions of the substances concerned in coagulation as in whole plasma. It likewise seems justifiable to conclude that bile and bile salts do not interfere with the formation of thrombin, since the prolongation of clotting time is just as great when preformed thrombin is added in ample quantity to fibrinogen solution as when thrombin must be formed from its precursors in the presence of bile. It cannot be a question of destruction of the thrombin as Morawitz and Bierich showed that a quantity of freshly drawn blood which had been mixed with sufficient bile to inhibit clotting could be caused to coagulate by merely diluting the mixture with isotonic salt solution. Consequently we must assume that it is the conversion of fibrinogen to fibrin that is interfered with rather than the formation of thrombin.

It was found that there was a retardation of

clotting great enough to be detected by clinical methods with amounts of bile greater than 5 per cent. The authors were unable to find reports in the literature stating the exact amounts of bile salts present in the blood in jaundice. Gilbert states that in cases of obstructive jaundice bile pigment is present in the blood in quantities of from 0.7 to 1 gram per liter. Bile itself contains about 1 gram of pigment per liter. The relation of bile pigments and bile salts in the blood in jaundice has not been determined, but it would seem possible that the salt is present in sufficient concentration to prevent clotting.

The conclusions drawn are as follows:

1. Within certain limits the clotting time of blood, blood plasma, and solutions of fibrin to which bile salts have been added is proportional to the quantity of bile present.

2. The bile interferes with the conversion of fibrinogen into fibrin and not with the formation of thrombin. G. E. BEILBY.

Vecki, V. G.: The Use of Intravenous Injections of Mercuric Chloride in the Treatment of Suppurating Infectious Diseases. *J. Am. M. Ass.*, 1919, lxxii, 1596.

The author has used mercuric chloride intravenously in gonorrhœal rheumatism and other complications of neisserian infection, in erysipelas, in various acute and chronic suppurative conditions, including furunculosis, carbuncle, anthrax, and adenitis, and in influenza.

The dose varies, but is usually between 3 and 5 cubic centimeters of a 1:1000 solution. The number of injections also varies from one to five or more. Two centigrams of mercuric chloride were given intravenously to a patient with severe anthrax who recovered, but had mercurial poisoning. A patient suffering from severe cystitis and pyelitis probably had a mercury idiosyncrasy as acute poisoning resulted from 3 milligrams of the bichloride. K. L. VEHE.

POISONS

Goadby, K.: Latent Infection of Healed Wounds. *Lancet*, 1919, cxcvi, 879.

This report summarizes work on postoperative flares, with special reference to latent infection in healed and unhealed wounds which comprised cavities containing metal fragments, wounds of the soft tissues, sequestra, etc. In studying the incidence of bacteria in 226 wounds, the facultative anaerobic streptococci were found to preponderate.

The histologic examinations demonstrated that in practically all wounds caused by shell fragments some degree of gas infection had taken place. While in none of the cases from which the tissue was taken was this infection diagnosed clinically, the evidence of the condition—alteration in staining and wide separation of the muscle-bundles—was unmistakable although in only a very few instances were the actual organisms seen.

The point of practical importance in the healing of gas-infected tissues is the space left between the muscle-bundles and the gradually forming fibrous tissue in which the organisms remain latent. Both anaerobic bacilli and streptococci have been shown to persist in tissues removed from healed wounds as long as one thousand days after the receipt of the wound.

An effort was made to control the flares arising from operation upon such cases by preliminary immunization. Polyvalent vaccine was used which was prepared from as many strains of streptococci as possible, obtained from latent infection, grown on human blood, and sensitized with polyvalent streptococcal serum. Fifty patients received the vaccine immunization previous to operation and 45 were not immunized. Eight of the 50 immunized patients showed a temperature reaction as against 36 of the 45 unimmunized patients. Therefore the chances for uneventful recovery as far as infection is concerned were five times better after vaccination. P. W. SWEET.

Hartsell, J. A., and Morris, M. L.: Report of Sixty Cases of Wound Diphtheria and Bacteriological Appendix. *J. Am. M. Ass.*, 1919, lxxii, 1351.

Hartsell and Morris report 60 cases of wound diphtheria which occurred in an army hospital in France.

Before the onset of the wound diphtheria there had been numerous cases of throat diphtheria in this hospital. While the latter condition never approached a real epidemic, its incidence was greater than would be expected in a hospital community. Most of the throat cases were in one ward. From Oct. 14, 1918, to Feb. 1, 1919, 11 cases of true throat diphtheria and ten carriers were found in this ward, and it was here that the outbreak of wound diphtheria centered.

The first case of wound diphtheria appeared in a large debrided wound of the thigh. This wound was of several weeks' standing and had been doing well under Carrel-Dakin treatment until November 20, when it suddenly showed a gray-black membrane. Cultures made at this time and December 9 and 12 were negative. Another culture made on December 13, however, was positive. Subsequent cultures were positive up to December 31, and then remained negative.

On December 13 when cultures were made from all the wounds in the ward 18 were found positive. The ward was immediately placed under strict quarantine and the most careful wound technique established.

The results of a study of the 60 cases were as follows:

1. In none of the wounds were there any systemic symptoms referable to diphtheria toxin. Most of the patients were well in every way and none showed any elevation of temperature other than that

which might well be explained as being due to a large debrided wound.

2. The clinical appearance of the wounds varied. Twelve per cent showed a gray membrane quite typical of diphtheria. About one-half showed only a faint grayish discoloration of the granulating surfaces which under ordinary conditions would have passed unnoticed. About 6 per cent looked absolutely normal and ready for secondary closure.

3. So far as could be observed, the presence of diphtheria bacilli in a wound had no effect at all on its healing. Wounds which were slow to heal invariably had large numbers of other organisms present. Wounds which appeared clear progressed in the ordinary way. Two wounds were positive up to the date of complete healing.

4. Forty-three patients received the Schick test and the results in six instances were positive. This is about the percentage for all adults.

5. The resistance to treatment varied greatly. In some cases the diphtheria disappeared with two days' intensive treatment, while other cases were very resistant, three remaining positive for forty-nine, forty-two, and twenty-four days, respectively, in spite of all treatment.

6. By far the most efficient treatment has been the use of tincture of iodine. Under the most rigid asepsis the wound was cleaned with a 1 per cent soap solution, ether, and alcohol, and then painted with U. S. P. tincture of iodine, care being taken to protect the surrounding skin. Under this treatment the average duration of positive cultures was six days. Fifteen cases cleared up within forty-eight hours and only eleven remained positive longer than one week.

Diphtheria antitoxin, up to four doses of 20,000 units each, was given in four cases, but had no effect. It was never necessary to give it for its systemic protection. Diphtheria antitoxin as a wet dressing was used in two cases, but without effect.

Acetic acid was given a thorough trial in four cases, but was also of no value.

Two wounds cauterized for a few seconds with phenol were reported positive the next day.

The Carrel-Dakin method, applied very exactly in eight cases, was a failure in six.

In studying the bacteriology, only such organisms as showed the typical morphologic characteristics were called diphtheria bacilli. The stain used was Loeffler's alkaline methylene blue, and microscopically it showed the organisms taking a blue stain throughout except at the extremities. The bodies either appeared granular (fine) or had the striped appearance so often noted. The clubbed ends took on a more violaceous hue and were homogeneous. Some showed a central swelling.

Soon after precautions were taken, the incidence of throat diphtheria fell until in the period from January 1 to February 1 no further cases developed in the ward. G. W. HOCHREIN.

McCalla, A. I.: Actinomycotic Infection. *Canadian M. Ass. J.*, 1919, ix, 411.

According to McCalla, the whole subject of actinomycotic infection is shrouded in darkness and uncertainty. In his article he discusses the subject under seven headings: definition, history, etiology, pathology, symptomatology, prognosis, and treatment.

Actinomycosis is defined as a subacute or chronic, local or generalized infection brought about by a specific microörganism, the actinomyces bovis, and resulting in necrosis and suppuration with the production of much granulation and connective tissue.

The organism was first seen by von Laugenbeck in 1845. The botanist, Harz, gave it the name "actinomyces" or "ray fungus." Since 1880 much work has been done, particularly by Wright, of Boston, but his findings are not everywhere accepted.

In its spread, the disease does not follow the fibrous and muscular planes of the body, but invades everything in its path, in this way resembling a malignant growth. The amount of connective tissue found is often enormous and far exceeds the size of the colonies of the microörganisms.

Healing may occur at one point when the disease is spreading at another. Irregular scar formation results. The disease spreads either by direct extension or by metastasis, through the invasion of the blood-vessels and the breaking off of masses of the mycelium. Secondary infection by the pus-producing cocci is exceedingly common. There is often glandular enlargement due to the suppurative processes, but the glands are never involved by the growth of the organism.

About 60 per cent of all cases are related to the mouth and pharyngeal cavities. In most instances infection probably occurs through carious teeth and may spread by direct extension to the bones of the jaw or the face. During the spreading the soft parts are involved and pus cavities are formed which, breaking on the surfaces, produce sinuses.

The bones of the skull and the brain may also be involved. In 15 per cent of cases the condition occurs in and about the thorax. Abdominal actinomycosis constitutes about 20 per cent of all cases. Beginning in the mucosa, usually of the cæcum or the appendix, the disease spreads through the wall of the gut involved, advances rapidly through and between the coils of bowel, forming masses of granulation tissue, and later, connective tissue. As it progresses, central necrosis of the masses is produced, resulting in the formation of abscess cavities.

A few cases of primary actinomycosis of the skin have been observed.

There is no definite symptomatology, but symptoms result from the tumor formation and suppuration. In abdominal cases the attention is often first called to the disease by the presence of a mass. At times the condition begins as an acute appen

dicitis. About the head it may occur as an acute illness with swelling, pain, and rise of temperature, but more often a mass develops slowly with very little discomfort except that due to the tumor itself. In the chest the symptoms are those of destruction of tissue with abscess formation. As long as the condition is confined to the lungs, the symptoms are very few. If a bronchus is opened, there is cough with expectoration in which the organism may be found. When the pleura is involved, there is pain. Actinomycosis usually affects the base of the lung, whereas tuberculosis is found in the apex.

The prognosis of the condition depends upon the site and extent of the lesion. In cases involving the head and neck, probably 75 per cent of the patients recover. In the thoracic type, the outlook is exceedingly bad. In the abdominal type the prognosis is unfavorable but better than in the thoracic form of the disease.

Recurrences are not rare, even after apparent cure. Two years should elapse before it should be assumed that the cure is definite.

The treatment resolves itself into three forms, surgical and medical, and treatment by radiation. In the surgical treatment the abscesses should be drained, sinuses curetted, and isolated foci removed, when possible, as in the early actinomycosis of the appendix. In all cases, whether possible or not to begin with surgical procedure, potassium iodide should be administered in large doses for long periods of time. Roentgen rays and radium when combined with surgical and medical treatment are supposed to have a beneficial effect in the limitation and cure of the disease.

The author cites five cases. G. W. HOCHREIN.

Watson, A.: Case of Death from Scorpion Stings. *Lancet*, 1919, cxcvi, 889.

Death resulting from scorpion stings is unusual. The following case presented some interesting features.

Private C., who was serving with his battalion in a forward area in Mesopotamia, was brought to the regimental aid-post about 11 o'clock one night suffering from scorpion stings. He was a small, slightly built man, aged 21. He stated that he had just been stung three times on the buttocks and thigh by a green scorpion which measured about 3 inches from the head to tip of the tail. The scorpion had been killed and was produced.

The patient appeared somewhat nervous and complained of a tingling "pins-and-needles" sensation all over, but otherwise his condition was quite good and he had no pain. He was given some brandy and detained in the aid-post for the night. Shortly afterward he fell asleep and slept for some hours.

His pulse and temperature were taken in the usual routine about 5 o'clock next morning; both were normal, and he appeared to be in good condition though he still complained of the "pins-and-needles" sensation all over his body. About an hour later he suddenly became collapsed. He was conscious, but very weak. There was a cold sweat on his forehead, his temperature was subnormal, and his pulse was slow and feeble. He was given strychnine and digitalin hypodermically and brandy and hot oxo by mouth. His condition rapidly improved and he was ordered brandy hourly and hot oxo every two hours. By mid-day he appeared to be out of danger and was taking quite an interest in what was going on around him. Treatment, however, was continued. At 4.15 p. m. he suddenly collapsed and died in a few minutes.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Kahn, M. H.: Tests of the Functional Capacity of the Circulation. *Am. J. M. Sc.*, 1919, clvii, 634.

Comparative functional tests of the circulation were made in 233 cases, including the normal, the various tachycardias, sinus bradycardia, thyrotoxic conditions, neurocirculatory asthænia, etc. The characteristic finding in simple tachycardia, compensated mitral regurgitation, and sinus bradycardia was the absence of any effect upon the pulse-rate or only a very slight increase after exercise.

In thyrotoxic hearts the characteristic effects were marked instability of the pulse-rate with great increase after exercise, associated with instability of the diastolic blood-pressure.

A similar effect, but less distinct, was found in neurocirculatory asthænia. In the latter condition it was noticed on ausculation that the thrill disappeared when the relationship of the apex-beat to the chest wall was disturbed or distorted. The tremogram recorded this as a differential point between neurocirculatory asthænia and the thyrotoxic conditions. Hypertonicity of the heart muscle is the physiological basis of the cardiac signs of neurocirculatory asthænia.

Thyrotoxic conditions and nephritic hypertension lessen the functional circulatory capacity. Aortic regurgitation and congenital heart lesions give fairly distinct features. MAX KAHN.

Steinfield, E.: The Plasma Chlorides in Anæmia: an Experimental Study. *Arch. Int. Med.*, 1919, xxiii, 511.

The chloride concentration in the plasma of the dog is raised during the active stage of infection with T. equiperdum at the period when anæmia is a prominent feature. This is not dependent on retention due to impaired ability of the kidneys to excrete chlorides.

In one observation, uranium nephritis in a dog which was rendered anæmic by T. equiperdum was followed by a still higher concentration of the plasma chlorides associated with a definite impairment of the renal capacity for excreting chlorides.

MAX KAHN.

Jackson, C. M., and Stewart, C. A.: The Recovery of Normal Weight in the Various Organs of Albino Rats on Refeeding after Underfeeding from Birth for Various Periods. *Am. J. Dis. Child.*, 1919, xvii, 329.

Previous research by the authors and others has shown that in young animals underfed for various periods of time remarkable changes occur in the weight of the various organs of the body. There is also evidence to indicate that similar changes occur in malnourished human infants. While some organs during inanition tend to maintain approximately their normal relative weight and others continue to grow, still others undergo losses. The organs affected and the extent of the changes involved vary according to the age of the individual and the length and character of the inanition.

There naturally follows the question as to the process of recovery on abundant refeeding after various periods of inanition. Stewart has already shown that rapid recuperation occurs in rats refed after being held at maintenance (constant body weight) from the age of weaning (3 weeks) to about the age of puberty (10 to 12 weeks). The various organs and parts usually recover their normal relative weights within four weeks of refeeding. The object of the investigation reported was to determine the extent of recovery on similar refeeding of rats which have been underfed from birth, during a period when the changes due to underfeeding are much greater than later. The results may perhaps indicate the probability of recovery in the various organs of infants after periods of inanition, a clinical problem of obvious importance.

From the data in the present series of refeeding experiments, the following provisional conclusions are indicated:

1. In albino rats underfed from birth to 3, 6, or 10 weeks of age, rapid growth in body-weight ensues on ample refeeding. Body-weights of from 25 to 75 grams are apparently reached more rapidly in those refed after underfeeding to 10 weeks of age than in those refed after underfeeding for shorter periods.

2. The length of the body remains slightly above normal in the group refed to 25 grams body-weight, but appears nearly normal in the others. The length of the tail and the weights of the head, limbs, and trunk appear nearly normal in all the refed animals.

3. As to the body systems, the integument appears subnormal in weight in the group refed to 25 grams, and usually normal or above in the others. The ligamentous skeleton appears nearly normal in all refed groups, but the cartilaginous skeleton (moist or dry) tends to be subnormal in weight. The musculature is nearly normal in weight, with a slight apparent deficit in the later refeeding periods. The visceral group (as a whole) and the remainder show no constant or significant variations in the refed animals.

4. The individual organs differ greatly in the extent to which they recovered their normal weight (compared with that in controls of the same body-weight) in the various groups refed to a body-weight of 25, 50, or 75 grams after underfeeding from birth to 3, 6, or 10 weeks of age. The weights of the various organs in the refed rats were as follows:

The hypophysis and suprarenal glands were apparently nearly normal in weight in all groups; likewise the heart, lungs, and kidneys, excepting an apparent overweight (of doubtful significance) in the groups refed after underfeeding to 10 weeks of age. The liver was rather irregular in weight, but probably within the range of normal variation.

The brain, spinal cord, and thymus appeared almost constantly subnormal in weight in all test groups. The apparent loss in the pineal body was of somewhat uncertain significance. The thyroid gland appeared subnormal on refeeding to 25 and 50 grams after underfeeding to 3 weeks of age; otherwise it was normal. The ovaries varied in weight and were apparently subnormal in the animals refed after underfeeding to 10 weeks of age. The epididymis appeared subnormal on refeeding to a body-weight of 75 grams.

The empty stomach and intestines were usually above normal weight in the refed groups. With contents they appeared more nearly normal in weight. The length of the intestines was somewhat above normal on refeeding to 25 grams of body-weight and nearly normal later. There was little change in the relative lengths of the large and small intestines. The eyeballs showed a slight overweight, of doubtful significance.

Two organs showed an apparent tendency to overcompensatory growth in the earlier stages of refeeding, with later retardation. The spleen was greatly above normal weight at a body-weight of 25 or 50 grams, but normal or subnormal at a body-weight of 75 grams. The testes showed a similar reaction, the apparent atrophy in the later stages of refeeding being especially marked.

G. E. Beilby.

Clark, A. H.: Effect of Diet on Healing of Wounds. *Bull. Johns Hopkins Hosp.*, 1919, xxx, 117.

The work of Hooper and Whipple on blood regeneration after anæmia shows that specific diets produce a very marked effect. The rate of blood regeneration on a meat diet is very rapid, a matter of days or a few weeks, whereas on a diet rich in carbohydrates it is very slow, months being sometimes required for complete regeneration. These results suggest the possibility that specific diets might exert some influence upon the rate at which wounds heal.

Carrel has studied the process of wound healing in both men and animals and has found that the curve representing the dimunition in size of an aseptic wound while it is cicatrizing is regular and geometrical. From Carrel's curves DuNouy has derived mathematical formulæ by means of which

the area of a wound at any given date can be predicted.

When in Carrel's experiments on animals (dogs, guinea-pigs, and cats) the wounds were kept as sterile as possible, he found the process of cicatrization to be divided into four stages:

1. The quiescent period: During this stage there is no contraction and the main characteristic of the period is its variable length, one to five days.
2. The period of granulous contraction: During this period the wound contracts at a rate which is proportional to the size of the wound.
3. The period of epidermization: The epithelium begins to form and the process of healing may continue by epidermization alone or by epidermization and contraction together.
4. The cicatricial period: After the wound is healed the scar enlarges.

To determine the effect of specific diets on wound healing the author carried out the following experiments:

Twelve dogs as nearly the same age, size, and general condition as possible were chosen and three put on each of the following diets:

1. Mixed diet: 41 grams of fat (lard or butter) and 107 grams of lean meat (beef or liver) boiled together, then mixed with 354 grams of bread and run through a meat chopper. This was divided among three dogs.
2. Carbohydrate diet: 500 grams of bread moistened with water, divided among three dogs.
3. Protein diet: 500 grams of lean meat, either round of beef or liver, boiled and divided among three dogs.
4. Fat diet: 300 grams of fat (equal parts of butter and lard) boiled and ground with 100 grams of bread.

The dogs were fed on these diets for three days before the wounds were made. Throughout the experiments they were weighed and the weights were found to remain practically constant. A second set of wounds was made after the first had healed, and finally a third set, the diets being interchanged.

In connection with the results it is interesting to consider the well-known fact that the ingestion of proteins produces a much greater increase in body metabolism than that of any other foodstuffs. In a recent monograph on the stimulating effects of nutrients, Benedict and Carpenter have given a very complete report on this question. They find that while carbohydrates give a maximum increment to the metabolism of 25 per cent, and fats 12 per cent, this increment occurs within two hours and the metabolism then returns rapidly to the base line. With proteins the increment reached a maximum of 25 to 45 per cent and persisted for as long as eight to twelve hours. This increase in metabolism, or excess energy given off by the body as a result of the ingestion of food, may be regarded as waste energy, but Benedict suggests that we may consider the extra heat developed under these conditions as a normal physiological stimulus to cellular activity. Practical experience with heavy muscular work on protein and carbohydrate diets points to this conclusion, and the results reported here would certainly support the theory that proteins have a specific influence in stimulating the whole cellular system to greater activity.

From the foregoing experiments the author concludes as follows:

The length of the quiescent period of wound healing is affected by the diet. It varies from zero in protein-fed dogs to six days in fat-fed animals. This variation is more marked in smaller wounds. As a consequence, the date of final healing in the protein and fat-fed dogs differs by about five days.

When the second period, or period of contraction, has set in, the rate of contraction is not affected by the diet. It is governed rather by a variable factor depending on the age of the wound and by a constant factor proportional to its original size:

$\frac{R_1}{R_2}=\frac{S_1}{S_2}$ when R_1 and R_2 = rates of healing of large and small wounds, and S_1 and S_2 = original areas of these wounds.

The beginning of Period 3, the period of epidermization, is independent of the size of the wound and the diet, and is determined by the age of the wound. Contraction and epidermization continue together until the wound is entirely healed.

After the wound is healed, the scar continues to contract until pigmentation sets in. During the latter process it enlarges and reaches a stationary state after pigmentation is complete.

G. E. Beilby.

Myers, J. A.: Studies on the Mammary Gland. The Effects of Inanition on Developing Mammary Glands in Male and Female Albino Rats from Birth to Ten Weeks of Age. *Am. J. Dis. Child.*, 1919, xvii, 311.

In a previous work attention was called to the fact that the postnatal development of the milk-ducts probably depends to some extent on the body-weight of the animal. The present work is an attempt to show: (1) to what extent the postnatal development of the milk ducts may be altered by changes in the normal body-weight of the animal; (2) the effect of severe inanition on the development of all parts of the mammary gland; and (3) the recovery of the mammary gland in animals when they are refed after inanition.

In the present study it was found that the mammary glands apparently responded somewhat slowly when the animals were refed after underfeeding from birth to about three weeks of age. In fact, the response was so delayed that they did not reach the stage of development ordinarily attained at the time of puberty (at about the eighth or ninth week of age) until the refed rat was about 18 weeks old. Stewart showed that in rats which were underfed for short periods, beginning at the time of weaning (when they were 3 weeks old) or

later, the integument and ovaries recovered very rapidly when the animals were refed. Later, however, Jackson and Stewart showed that when the underfeeding is begun at birth and continued three weeks or longer, a permanent stunting of the body usually occurs.

In view of the great individual variation in the development of the mammary glands at any given age or body-weight (as shown by Myers), it is hazardous to draw any final conclusions from the relatively few cases observed in the present study. Apparently, however, the mammary glands in the underfed young rats, though temporarily lagging somewhat behind the body-weight when the rats are fully refed, may ultimately attain a normal degree of development.

The author summarizes the article thus:

1. Severe inanition retards the growth of the milk-ducts of the female rat during the first week, but apparently does not completely stop their growth. In animals held at birth weight for a longer time the ducts cease to grow and remain in a condition slightly more developed than at the time of birth. If after the first week the gross body-weight of the animals is allowed to increase so as to correspond to that of a normal animal one week old, the milk-ducts fail to develop to the same extent as those of a normal animal of corresponding body-weight. This holds true also if the body-weight of the underfed rat is allowed to equal that of a normal animal two weeks old.

2. The lumen of the primary duct in underfed rats does not communicate with the exterior through the milk-pore until the tenth week.

3. The growth of the milk-ducts of male rats is retarded by inanition in a manner similar to that observed in the female.

4. The nipple grows little during inanition, being elevated above the surface only slightly in young rats starved severely for eight to ten weeks. The epithelial processes fail to develop much beyond the stage reached at birth, and the sulcus around the base of the normal nipple remains shallow.

5. The subcutaneous fat that appears very early in the neighborhood of the milk-ducts soon becomes greatly decreased after the amount of food is reduced to a minimum.

6. In all, the retardation in the development of the mammary gland is roughly proportional to the retardation in body-weight, at least within the limits of normal variability.

7. Severe inanition for a short time at an early age thus temporarily stunts the mammary glands. When the animal is refed the glands respond slowly. When the body-weight during refeeding reaches that of a normal rat at the age of puberty, the milk-ducts are far behind those of the normal rat of corresponding body-weight. That this stunting is not permanent is shown by the fact that the ducts ultimately attain the same stage of development as those of a normal animal, but at a much later period. G. E. Beilby.

Stewart, G. N., and Rogoff, J. M.: The Action of Drugs upon the Output of Epinephrin from the Adrenals. I. Strychnine. *J. Pharmacol. & Exper. Therap.*, 1919, xiii, 95.

Stewart and Rogoff have determined experimentally on dogs and cats that strychnine produces a prolonged increase in the output of epinephrin. The accumulation of epinephrin in the glands as well as its liberation is increased. This is what occurs during stimulation of the splanchnic nerve, except when intermittent stimulation is long continued. Accordingly, the effect of the strychnine seems to be produced not by direct action upon the glands but by an intensification of the secretory process through the normally governing nervous mechanism.

The conclusions are all based on assays of adrenal blood with rabbit intestine and uterus segments, corroborated by the study of the effects produced on the blood-pressure by adrenal blood collected in a cava pocket and introduced into the circulation in various ways.

It is pointed out that the technique employed in measuring variations in the epinephrin output must take into account concomitant changes in the rate of the blood-flow as well as changes in the concentration of epinephrin in efferent adrenal blood.

The increased output observed was as much as ten times the normal amount, and it is possible that the samples tested did not contain the maximum increase. The increase was found to persist for one to one and one-half hours, beyond which time the experiments were not prolonged. The last samples of blood, especially with the smaller doses, sometimes showed an output of epinephrin as great as or greater than that shown by any of the earlier specimens.

A considerable increase was produced by doses of strychnine well within the therapeutic range. The minimum effective dose was not sought. The increased output was associated with a variable increase in epinephrin concentration even when the rate of blood-flow through the adrenals was increased, though never to a degree greater than the maximum normal concentration. Without strychnine under similar experimental conditions no increase in epinephrin output was detected.

The increased rate of output was occasionally preceded by a transient diminution, especially with smaller doses given subcutaneously. Larger and intravenous injections probably masked the preliminary decreased output. W. H. Nadler.

MacNider, W. D.: A Functional and Pathologic Study of the Chronic Nephropathy Induced in the Dog by Uranium Nitrate. *J. Exper. M.*, 1919, xxix, 513.

Since the initial observation in 1888 by Chittenden and Hutchinson that uranium salts will induce acute nephropathy, these substances have been extensively used as acute nephrotoxic agents. Little is known, however, regarding their effect on the kidney in prolonged intoxications. Such obser-

vations as have been made are largely concerned with the type of the pathologic response on the part of the kidney and the processes of repair which take place during its recovery from the acute injury.

The investigation here reported was undertaken with the object of studying the functional capacity of the kidney during the period of acute injury from uranium and also the period when it is recovering from the acute degeneration and passing into a stage of chronic injury characterized by such changes in structure that the condition may be considered to represent some type of chronic nephropathy.

In previously published papers the observation has been made that the acute injury from uranium to the normal kidney or the naturally nephropathic kidney is associated with the development of an acid intoxication. In the present study observations were made of the changes in the acid-base equilibrium of the blood of the animals not only during the period of acute damage to the kidney, but also during the period of recovery from such an injury, when it was possible to study the relation of the changes in the blood to the processes of repair and the return of the functional response of the kidney.

Twenty-seven female dogs were used. The animals varied in age from 5 months to 10½ years. For four days prior to the beginning of the intoxication they were kept in metabolism cages. During this period, studies of the urine, blood, and functional capacity of the kidneys were made in order to eliminate animals which had a naturally acquired nephropathy. All of them were free from renal disease. They were given 500 cubic centimeters of water daily, and fed on bread with a small amount of cooked lean beef. Once a day they were catheterized and the amount of urine obtained was added to the cage urine for analysis. The experiments were terminated at various periods during the intoxication without the use of an anæsthetic, this method eliminating the development of acute degenerative changes in the liver as well as in the kidney. The animals were poisened with a dose of 4 milligrams of uranium nitrate per kilogram of body-weight, given subcutaneously.

During the course of the experiments the urine was examined quantitatively for albumin by Esbach's method, and for glucose with Benedict's reagent. The functional capacity of the kidney was studied by noting the percentage retention of blood urea, as shown by Marshall's method modified by Van Slyke and Cullen, and also by the elimination of phenolsulphonephthalein. The latter functional test was conducted according to the technique of Rowntree and Geraghty. Observations on the acid-base equilibrium of the blood were made according to Marriott's method by ascertaining the alkali reserve of the blood and the tension of alveolar-air carbon dioxide.

The experiments conducted in this investigation confirm the earlier work of Dickson who demonstrated that uranium would produce in some of the lower animals a chronic kidney injury comparable to certain of the chronic diffuse nephropathies in man. They further show the character and severity of the functional disturbance associated with the various stages of the uranium intoxication. The severity of the acute degenerative changes in the kidney is largely dependent upon the age of the animal. The older animals developed a more rapid and severe type of intoxication than the younger animals. The intoxication is characterized by a reduction in the alkali reserve of the blood and the development of a kidney injury. The injury to the kidney is expressed functionally by the appearance of albumin in the urine, a reduction in the elimination of phenolsulphonephthalein, and a retention of blood urea.

All the animals intoxicated by uranium showed a disturbance in the acid-base equilibrium of the blood, as indicated by a reduction in the alkali reserve and a decrease in the tension of alveolar-air carbon dioxide. The depletion in the alkali reserve developed more rapidly and was more marked early in the experiments in the older animals than in the younger animals. The severity of the intoxication as expressed by the degree of functional disturbance of the kidney paralleled the severity of the disturbance in the acid-base equilibrium of the blood.

From these results the author draws conclusions as follows:

1. Uranium nitrate is relatively more toxic for old animals than for young animals.
2. This relative toxicity is expressed in the old animals not only by a greater functional disturbance of the kidney, but also by inability to repair the kidney injury and re-establish its functional capacity.
3. The intoxication in younger animals is followed by repair of the renal injury and partial restoration of kidney function.
4. In these animals the processes of repair lead to the development of a chronic diffuse type of nephropathy in which the acid-base equilibrium of the blood may be maintained at the point of normality. Renal functional tests indicate the presence of severe kidney injury. G. E. Beilby.

ROENTGENOLOGY AND RADIUM THERAPY

Davidson, J. M.: Stereoscopic Radiography. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Section Electro-Therap., 1.

Stereoscopic radiography has two aspects: the vision of the observer and the preparation, placing, and viewing of the X-ray plates. As to the first, the observer must possess binocular vision, that is, he must be able to see the two plates and obtain the combined impression. The eyes need not be equally good. In some persons both eyes, though equal, lack coördination. Others, who are able to see ordinary stereoscopic photographs correctly, have difficulty in seeing X-ray pictures in their proper relief.

These facts are important because they explain how it is that many persons do not understand what is meant when reference is made to the vivid relief of the stereoscopic image. To those who can see it properly the importance of the stereoscopic picture is obvious, requiring no special elaboration, and there can be no doubt that the slow progress in this branch of the work is due to the fact that many workers do not realize their limited binocular capacity.

The production of the proper plates need not be complicated by minute details as to the distance and displacement of the tube. For ordinary distances a displacement of 6 centimeters will suffice.

For teaching the principles of stereoscopic practice, Davidson uses two lights, red and green, and a skeleton cone of wire. The wire cone has two shadows. The one in which the wire intercepts the green light appears red because the red light is not intercepted at that point. Similarly, the shadow in the red light appears green. By using spectacles with one red and one green glass these shadows may be seen stereoscopically and all the factors of stereoscopic X-ray practice, both producing and viewing, may be demonstrated at will. More can be learned in a few minutes by practical experiment along these lines than from much reading of theory.

A point of great importance which if not realized may lead to serious error is that during and between the two exposures the most complete immobilization of the parts must be maintained.

An easy and convincing illustration is the making of stereoscopic plates of a hand, with a slight movement of one finger between the exposures. The image of the unmoved fingers will be correct while that of the other will appear bent forward in an incorrect plane. This point is of the greatest importance in examinations of the chest in which dissimilar stages of respiration produce like incorrect results.

That the apparent far and near points of the stereoscopic image are reversed by changing the plates from right to left is explained by Davidson as due to the fact that, in the development of the visual apparatus from infancy, it is discovered that when an object is near it is necessary to converge the eyes to see it, and when it is farther away it is necessary to diverge them. Therefore the convergence and divergence of the eyes become associated respectively with near and distant objects. These principles, which may be easily demonstrated in a line drawing, apply equally to the hundreds of corresponding points in a pair of X-ray plates. D. R. Bowen.

Tousey, S.: A Method of X-Ray Localization of Bullets and Other Foreign Bodies. *Internat. J. Surg.*, 1919, xxxii, 142.

The author's method requires (1) a lead mark fastened to the skin where it is in contact with the plate; (2) facilities for making two exposures with the tube at a measured distance from the plate and displaced a measured distance after the first exposure; and (3) a wire netting laid upon the plate during the exposure and therefore radiographed upon it or laid upon the finished plate.

The lead mark which is either left fastened to the skin until the time of operation or is replaced by an indelible ink mark, forms a surface guide to the general topography of the foreign body. If the latter is not in contact with the plate, its image will be double and the amount of displacement will be a guide to its distance from the surface which was in contact with the X-ray plate. A printed table shows the distance in inches from the surface to the foreign body corresponding to different displacements and designated as so many meshes of the wire netting. The method is useful not only for projectiles but for other foreign bodies such, for example, as calculi.

Adolph Hartung.

George, A. W., and Leonard, R. D.: The Use of the X-Ray in the Study of Multiple Diverticulitis of the Colon. *Med. Clin. N. Am.*, 1919, ii, 1503.

Beginning with a review of the literature showing that intelligent appreciation of multiple diverticulitis of the colon dates back hardly fifteen years, George and Leonard observe that it now occupies an important place in medical literature and is recognized as a distinct clinical entity by every operating surgeon of large practice.

The cases of the condition are grouped by the authors as congenital and acquired. The acquired group only is considered in this article. Diverticula are true or complete, and false or incomplete. Those of the colon are placed in the latter group as their walls carry only the mucous and serous coats. The suggestion that all were originally true diverticula, the muscular coat having disappeared by atrophy, is held by the authors to be rather improbable. While diverticula of the large bowel are found most commonly in the descending colon and sigmoid, X-ray experience indicates that their occurrence in the ascending and transverse colon is more frequent than has been believed.

Fæcaliths may form in the pouches and the latter may slough, giving rise to free bodies in the abdominal cavity. The mere presence of a diverticulum is not necessarily productive of symptoms; in fact, X-ray evidence without local symptoms is frequent. This being the case, the recognition of inflammatory sequellæ is of the utmost importance.

Secondary changes, which in general are the result of infection through the walls of the diverticula, may be classified as follows: (1) general peritonitis; (2) acute gangrenous inflammation from strangulation of the pedunculated type; (3) chronic proliferative extramucosal inflammation which is the most constant pathologic process, and in which large palpable masses containing the diverticula tend to surround the gut, produce actual obstruction, and lead to the diagnosis of cancer; (4) adhesions involving other organs; (5) perforation, acute or chronic, the latter followed by abscesses or fistulæ to other organs; (6) chronic inflammation of the

mesentery; and (7) the development of cancer in the inflammatory mass.

In McGrath's series of cases of advanced peridiverticulitis 25.9 per cent showed evidence of malignancy.

Men of middle age and over with a tendency to obesity are predisposed to this condition. Frequent sites of diverticula are the points of entry of the blood vessels. In general, herniæ result from pressure within a cavity plus a local weakness of the wall. These conditions are frequent in the sigmoid and here diverticula most commonly occur. Pain is present in a large percentage of cases, usually as the result of secondary changes, and varies with the degree and type of inflammatory change from acute peritonitis to acute obstruction. In about 15 per cent of the cases there is severe abdominal pain. The passage of macroscopical blood is rare, an important point in the differentiation from cancer.

George and Leonard urge routine roentgenographic examination of the abdomen before the ingestion of the opaque meal. This will often disclose shadows that might lead to confusion if mistaken for parts of the opaque meal. Urinary calculi, calcified glands, and sclerosis of iliac arteries all produce shadows which may simulate the contents of diverticula.

The usual opaque meal is two glasses of buttermilk with 1½ ounces of barium sulphate to each glass. The colon is visualized best twenty-four hours after the meal. As a frequent site of diverticula is near the mesenteric attachment, the shadows may be hidden if only an anteroposterior plate is made. Palpation under the fluoroscopic screen and stereoscopic plates may reveal some of the hidden diverticula.

The pockets may retain barium for a long period and plates made from thirty-six to forty-eight hours after the meal show the diverticula to best advantage. At this time, with the lumen of the colon free from barium, the barium-filled diverticula stand out distinctly.

The barium enema usually will not fill the diverticula but may give valuable information as to secondary changes involving the lumen of the colon. In general, the inflammatory changes from diverticulitis will present a gradually reduced lumen, while in cancer the reduction will be abrupt. Obstruction from cancer is apt to be severe, rapidly progressive, and finally complete. Obstruction from diverticulitis is usually not severe, very slowly progressive, and rarely complete. An intermittent tumor, palpable and fluoroscopically visualized as of the colon, is always peridiverticulitis. A constant tumor mass may be cancer.

Almost pathognomonic of chronic diverticulitis is a peculiar serrated appearance of the bowel, particularly along the descending colon and sigmoid. This may extend over several inches and is associated with more or less narrowing of the lumen. The serrations are small, close together, with rather sharp points, presenting at times a saw-tooth appearance. They will not be confused with haustral shadows, being too numerous and too small. Moreover, they are constant in shape and position.

Some acute attacks of diverticulitis simulate left-sided appendicitis, but the X-ray examination will demonstrate the normal position of the cæcum and appendix.

It must be borne in mind that the diagnosis of multiple diverticulitis is not made by the X-ray alone, although in some cases it may seem possible. The X-ray evidence must be considered with all the clinical and laboratory findings. This is of particular importance in the differentiation of cancer and multiple diverticulitis. D. R. BOWEN.

Schmitz, H.: The Biological and Therapeutic Action and the Clinical Value of Radium and Roentgen Rays. *Charlotte M. J.*, 1919, lxxix, 161.

The effect of rays upon living cells is both degenerative and destructive. Whether the cells are normal or abnormal, the nearer they approach or remain in an undifferentiated embryonal state the more readily they undergo cytolysis or destruction.

The difference in sensitiveness of cells to the rays depends upon age—the momentary phase of the developmental period in which they happen to be as well as the age of the host—and on the histologic species and the varieties in each of these.

Cells which are in the embryonal and undifferentiated state or have not advanced far beyond this stage of development are destroyed by a dosage of rays which would excite only a simple reaction in the surrounding mature tissues. The more undeveloped the embryonal cells of a malignant tumor, the more sensitive they are to radiation.

An arrest occurs in the growth of a tumor soon after treatment. This is due, first, to serous infiltration, increase in cell-size from enlargement of the nucleus, and obliteration of capillaries from an increase in the size of the endothelial cells, and, second, to degeneration of the cell nucleus. These changes are of a traumatic nature and cause an inflammatory reaction resulting in a lymphocyte and leucocyte infiltration and a proliferation of the stroma.

Abnormal cells are always demonstrable on microscopic examination, but are in a state of degeneration as shown by the absence of mitosis and every known variety of karyolysis, cytolysis and achromatism. It is impossible to say, however, whether these cells are merely dormant or absolutely harmless and dead. Possibly the processes affect the cell nucleus, preventing further mitosis. Such radiumized tissue will not grow when inoculated in mice.

As the therapeutic action of radium is confined to a radius of 4 centimeters, it is purely local. The action of the roentgen rays from a correctly adjusted Coolidge tube is far more intense and diffuse. Radium is used in body cavities, applied directly into or against the tumor mass, and in surface

growths when purely local action is desired. In all other cases the roentgen ray is preferred.

Schmitz closes his article with a tabulation of 283 cases of malignancy treated with radium and the roentgen ray. Pre-operative and postoperative raying with as radical removal as possible is the technique recommended. D. R. BOWEN.

MILITARY SURGERY

Keith, A., and Hall, M.: Bones Showing the Effects of Gunshot Injuries Now in the Army Medical Collection. *Brit. J. Surg.*, 1919, vi, 537.

This article is based on a study of 467 macerated bone specimens which are all that have been mounted of the specimens forwarded to the museum of the Royal College of Surgeons of England.

Among these are 109 specimens of cranial injury which the authors divide into three main groups: (1) injuries of contusion; (2) injuries due to penetration; and (3) injuries due to through-and-through perforation.

A particularly interesting group among the injuries of contusion are those in which there is no depression or fracture of the external table but a fracture of the internal table. There are only five of these specimens and their rarity is attributed by the writers to the low mortality resulting from this type of injury. In one specimen the fragments of the inner table had been driven deeply into the substance of the brain.

Among the injuries due to penetration a secondary injury was sometimes produced in another part of the cranium. Some of the apertures are clean cut and others are fissured or show the effects of explosive force.

The injuries due to perforation are defined as that type in which the missile passes through two walls of the skull, producing a wound of entrance and a wound of exit.

The effects of explosive force and all gradations of fractures are seen. One specimen shows evidence of explosive force which wrenched the occipital sutures open. A trephining or decompression operation had been done in 26 specimens.

A characteristic fracture following tangential or glancing blows is a fracture with four fissures radiating from the point of origin, two of which diverge upward and two downward.

A study was made also of the specimens which show healing processes. One school has emphasized the importance of the periosteum in bone repair of the cranium, and another the value of cancellous bone. In these specimens the authors traced the separation of dead bone fragments and areas of infected bone by a process of sequestration, but in every case the amount of callus is scanty. In the older specimens, the fragments have been cemented in place by internal callus, and gaping fissures have become filled and obliterated. These points the authors believe show that, at least in the cranial bones, the cancellous bone is the only part capable of producing callus. In old apertures they found a process of absorption at the margin. These margins have become thinned out and smoothed, but in none of the specimens in the collection was there observed any tendency to bridge over the defect, even after a year's time. G. L. MCWHORTER.

McKenzie, R. T.: The Functional Re-Education of the British Soldier. *Med. Rec.*, 1919, xcv, 827.

From a very deplorable state the camps for convalescents, increased to sixteen organized camps, each having a capacity of 5,000 patients.

The men in these camps were divided into four classes: Class A, those fit for active service; Class B, those fit for service on lines of communication; Class C, those fit for home work only; and Class D, those still under treatment and unclassified.

Patients with shell shock and nervous troubles were given a neutral bath the temperature of which was about 93 degrees. After this bath they were wrapped in blankets and allowed to rest. The next day they were taken for a slow walk. Arms and legs having scar tissue were bathed in water with a temperature of 112 degrees. Electrotherapy and ionization were also used to some extent. Dry and radiant heat preliminary to massage was found to be beneficial. Apparatus was devised to make the patients use their muscles. As they improved they were put into classes and the exercise increased.

Gassed patients who were merely neurotic were given breathing exercises. When a nerve had been caught up in scar tissue radiant heat afforded greatest relief. In cases of foreign bodies it was often found that massage started up inflammation and assisted in speeding their removal. In the case of patients with deformities of the face, facial masks made of a thin film of copper were of great value.

A test of going through wire entanglements was given the men before they returned to service. This taught them knee raising, balancing, and the estimation of distance. After treatment it was possible to place about 40 per cent of them into Class A. F. P. HAMMOND.

Biggar, J. L.: Rehabilitation in Canada. *Med. Rec.*, 1919, xcv, 821.

In restoring an injured soldier to a gainful occupation, the state should first see that the disabling condition is overcome as much as possible by the best medical and surgical care; that the functions of the injured parts are restored to the utmost; and that artificial appliances are used when they will render the patient more independent.

A Military Hospitals Commission which was established first in Canada was later absorbed by the Department of Soldiers Civil Re-establishment.

Many of those accepted for military service regardless of fitness during the early days of the war have returned for care. The cases of insanity and tuberculosis and the orthopedic cases have been

placed in separate hospitals. Soldiers who would recover in a short time have been kept in military hospitals. Those who will not recover before a longer time are discharged and cared for in a civilian hospital under government control, a plan which relieves them from military discipline and teaches them self-reliance. Ex-soldiers suffering from recurrence of a disease for which they were discharged from the army also receive medical care and an allowance equal to their pay in the army.

Muscle-training apparatus and games of all sorts have been used to restore loss of function. Massage, physiotherapy, and electrotherapy are obtaining more recognition.

Owing to the lack of skilled men to make artificial limbs, disabled soldiers are trained to do this work. In addition to artificial limbs, a special boot, elastic stockings, supporting belts, etc., are provided.

About fifty thousand men have already been discharged with disabilities. Of these it is hard to know how many will return to their previous employment because some of them may be afraid of losing their pensions by showing their ability to work, the employers have needed help so badly that they would take anyone, and the possibilities and advantages of training are only now becoming known.

About 10 per cent of those disabled will require a course in industrial training. Each applicant is thoroughly examined and his case investigated. Approximately 10 per cent are refused. The training given is of three types: ward training, occupational workshops and class rooms, and the official course known as industrial training.

In determining pensions the candidate's prewar occupation is not considered and the pension is not reduced because of subsequent success. All disabilities except those from vicious and improper conduct should be pensionable. Another payment is based on the length of service. Land may be procured by soldiers on easy payments and also $2,500 for material needed.

During the last few years the advantages of preventive measures against disease and the necessity for sanitation have become more evident. Another observation resulting from the war is the extent of nervous disorders among people supposedly in good health. In therapeutics the greatest advance has been made in functionl training. Physiotherapy also has made great strides.

F. P. Hammond.

GYNECOLOGY

UTERUS

Graves, W. P.: Cancer of the Uterine Body as a Borderline Case in Gynecology. *Med. Clin. N. Am.*, 1919, ii, 1289.

Graves sums up his conclusions as follows:

1. Cancer of the body of the uterus may be classed as a borderline condition because of the frequency with which it is treated medically by the general practitioner.

2. The slightest show of blood after the menopause should demand an immediate curettement of the uterus for microscopic examination of the endometrium even though bimanual examination reveals nothing abnormal.

3. Cancer of the uterus, both of the fundus and the cervix, often causes a water discharge which simulates urine. Such a discharge from the vagina is therefore a signal of danger.

4. Cancer of the uterine body is operable long after its initial symptoms. It is the most favorable for operation of all deep cancers because of its slow growth, late metastasis, and long confinement to a group of organs that can be removed easily.

5. Cancer of the uterine body may occur in the menopause decade and resemble in its symptoms uterine insufficiency.

6. The menopause is characterized normally by a lessened flow of blood. An increase of blood at that time is an important danger signal.

7. An increase in the flow of blood near the menopause should always be investigated by microscopic examination of the curetted endometrium even if digital examination reveals no anatomical abnormality.

8. Radium is almost specific for controlling hæmorrhages of uterine insufficiency.

L. R. GOLDSMITH.

Bordarampé, J.: Uterine Epithelioma Treated with Benzol (Tratamiento del epitelioma del utero por el benzol). *Rev. Asoc. méd. argent.*, 1919, xxx, 237.

In a few cases of histologically diagnosed uterine cervical epithelioma the author has obtained excellent results from the use of benzol. There is no sign of further progress of the disease and the patients' weight has progressively increased.

The treatment is simple. A tampon wet with pure benzol is left in contact with the neoplasm for five minutes and then replaced by a dry sterile tampon. Two lavages of 2 liters of warm water to which 50 drops of benzol has been added are given daily, the liquid being kept constantly stirred.

Fœtidness, secretions, and pain disappear and there is a slow and gradual destruction of the tumor followed by epidermization. The weight increases about 1 kilogram per week.

While the cases treated are few and the time which has elapsed since the treatment is short, the author feels that this method, which he believes he originated, deserves to be brought into notice. For a number of years he has made a study also of the effects of benzol on normal and neoplastic tissues other than cancer and is satisfied that while it destroys neoplasms it does not harm normal tissues.

W. A. BRENNAN.

Little, J. W.: Radium in the Treatment of Uterine Fibroids. *J.-Lancet*, 1919, xxxix, 219.

This is a report of 77 cases of uterine fibroids. Sixty of these were treated with radium and there were no deaths in the series.

As yet the methods of employing radium have not been standardized, the amount to be used and the length of time it should be applied being based on individual experience. The important facts for a beginner to remember are that radium is a very powerful agent and that it is much better to use a little than too much.

Hæmorrhage from fibroids of the uterus is quickly and effectively stopped by the introduction of 50 to 100 milligrams of radium in tubes placed in an ordinary rubber catheter and inserted into the uterus where it should be allowed to remain from two to twenty-four hours, depending upon the indications. A little gas anæsthesia may be needed for its introduction.

The patients in the series reported remained in the hospital one or two days, after which they went about their usual duties. With most patients one application was sufficient, but a few required two or three treatments. The tumors usually disappeared gradually. Large fibroids causing pressure symptoms and those suspected of malignant degeneration were removed. If the uterus was soft or there was a rapidly growing tumor, the number of milligram hours of radium treatment was reduced, the reason being that the newly formed cells if broken down too rapidly might produce a dangerous toxæmia.

The usual operative complications, such as pain, morbidity, thrombosis, and pulmonary embolism, are avoided by radium, and there are no contraindications to its use in debilitating conditions such as diabetes, nephritis, and anæmia. Its action depends upon the production of endarteritis and upon cauterization of the endometrium.

The ages of the patients in the author's series varied from 33 to 73 years; the amount of radium used, from 50 to 90 milligrams; and the time of application from 3 to 26 hours, depending on the condition and the number of treatments received. The

largest number of milligram hours received by one patient was 6,120, this being the aggregate of three applications. C. D. HAUCH.

EXTERNAL GENITALIA

Gallagher, J. F.: Syphilitic Induration of the Vulva; With Report of Four Cases. *Surg., Gynec. & Obst.*, 1919, xxviii, 482.

The term "elephantiasis" has been applied to a large group of cases of chronic enlargement of a part, with or without ulceration, and microscopically characterized by increased connective-tissue formation with lymphatic dilatation. Huguier applied the term "esthiomène" to this condition when it involved the vulvo-anal region, and in such cases Hyde, Taylor and Kurz believed it to be a manifestation of tertiary syphilis. For both of these, the author substitutes the term "chronic syphilitic induration of the vulva." Microscopically, syphilis and tuberculosis may be confusing.

CASE 1. The patient was a mulatto laundress, 30 years of age. Her mother was living and well; also one sister. Her father and one sister had died of an unknown cause. The patient used tobacco and alcohol. She had had no illness of importance, but had suffered from hæmorrhoids all her life. Occasionally she had pain on defecation and had passed blood and mucus in the stools. There had been also several attacks of nocturia and burning on urination, but no hæmaturia. Her menses were normal. Ten years previously she had a miscarriage at four months, followed by an uneventful recovery. A venereal history was denied. Four years previously she noticed in the region of the clitoris a growth about the size of the thumb which had increased in size steadily to the time of the examination. About eight months previously a growth had been noticed about the anus which was associated with a burning sensation but no ulceration. The physical examination revealed enlargement of the tonsils, and there was a loud systolic murmur. The inguinal lymph glands were palpable. In the region of the clitoris and involving both nymphæ was a pedunculated tumor measuring 12 by 15 centimeters, and on the right side of this tumor an erosion 2 by 4 centimeters, in size. The labia majora were very much thickened and hard like pigskin. Covering the entire perineum and extending back to, and including, the anus, was a large cauliflower-like red growth with a very slight discharge. The urinary meatus and vaginal walls were normal. The Wassermann test was 4+.

CASE 2 was that of an unmarried negro domestic, 19 years of age. Her family history was negative and she herself had never had any illness of importance. In the past year she had lost 30 pounds in weight. For the last three months she had had leucorrhœa. Her menstrual periods had been normal except that the last one was missed. She had had no children, miscarriages, or abortions. On the hard palate was an ulceration the size of a dime. Eighteen months previously she noticed a small nodule on the left side of the vulva, and later a similar swelling on the opposite side. Both were hard and had continued to grow up to the time of examination. At night they were painful. The inguinal glands were palpable. On the left labium was a rather soft, fluctuant, not tender tumor, 6 by 8 by 12 centimeters in size, and on the right, a similar tumor measuring 4 by 5 by 7 centimeters. Between the two masses, covering the labia minora and the vestibule and extending to the perineum, was an ulcerated area with a foul-smelling discharge. The urine, blood and Wassermann tests were negative.

CASE 3. The patient was a mulatto housewife, aged 32. Her family and personal history were negative. Thirteen years previously she had had typhoid (?) fever for one year and was sick two years. Since then she had been unable to walk on account of contractures of the flexors of the toes and the calf muscles. She had not had any children, miscarriages or abortions. For fifteen years she had had leucorrhœa. She denied venereal infection. She had not lost weight. Two years previously she noticed an enlargement on the upper part of the external genitals. Six months later ulceration developed beneath the tumor. She had pains of a burning character which were worse at night, and was poorly nourished. The inguinal lymph glands were palpable. The lower limbs were small from disuse. Knee jerks were absent. Growing from the region of the clitoris was a tumor 5 by 7 by 10 centimeters in size. Two smaller growths projected from the lower edge toward the vagina. Involving the entire perineum and extending out to the inguinal folds was an ulcerated area with elevated, undermined edges. The Wassermann test was 5+; the urine negative.

CASE 4. The patient, an unmarried negro nurse, aged 19 years, had a negative family history except that her father and one aunt had died of heart disease. She complained of nocturia, but denied venereal infection. Her menstrual history was negative though she had not menstruated in the last three months. She had not had any children, miscarriages or abortions. For three and a half years she had had leucorrhœa. About one month after the beginning of the vaginal discharge, a severe itching of the vulva began and was followed by a sore which she believed was due to scratching. This sore persisted and in about one year she noticed a swelling on the right side of the vulva. During the past three months there had been a similar swelling on the left side. Between the two tumors was an enlarged ulcer which had grown from the first tumor. On examination the patient appeared older than her age. She had some œdema of the eye-lids, her pupils did not react to light or accommodation, and there was an external squint in the left eye and nystagmus. The front teeth were markedly deformed. There was generalized lymphadenopathy. The reflexes were present but sluggish. In the right labium was a tumor 4 by 6 by 10 centimeters in size, in the left a second growth about half as large, and in the region of the clitoris a third measuring 3 by 3 by 4 centi-

meters. Beneath the tumors, extending out on the thighs and back around the anus, was an ulcerated area with elevated edges. This ulcer extended also into the posterior wall of the vagina. About 1 inch inside the vagina was a constriction which admitted only the index finger. The blood showed a leucocytosis of 12,000 and a 4+ Wassermann.

On removal all tumors were found to be vascular and to have a pearly white base which exuded serum on pressure. There was a thickening of the surface epithelium and perivascular infiltration. Giant cells were present, but no caseous masses. One tumor contained demonstrable spirochætæ pallidæ.

The treatment consisted in the removal of the growths and a plastic covering of the denuded areas followed by vigorous anti-syphilis treatment.

C. D. HOLMES.

MISCELLANEOUS

Bandler, S. W.: Sterility in Women, with Special Reference to Endocrine Treatment of Same. *Med. Clin. N. Am.*, 1919, ii, 921.

The first thirteen pages of this article review the various phases of sexual development and the part played by the internal secretions. The author discusses the causes (internal secretions) of dementia præcox, postpartum mania, menstruation, amenorrhœa during pregnancy, the ability to resist disease, the bad effect of the recent influenza epidemic on pregnant women, the phenomena of labor, the causes of repeated miscarriages, and the menopause. He comments also on the use of pituitrin during labor, the recent increased surgical trend of obstetrics, and the decreased surgical trend of gynecology.

He then comes to the subject of the causes of sterility in women, discussing the importance of each. The causes considered include retroflexion and inflammation—he urges against the use of the curette in this latter case and in fact in most cases—and cervical obstruction. He suggests that in looking for the cause of sterility it is well to determine the the following points: Are ripened ova given off or are the ovaries cystic (he describes an operation which he uses to correct the latter fault); do ova reach the uterus or are the tubes closed; if the ova reach the uterus do they fail to attach themselves even though impregnated? He suggests also that frequently the fault is not the woman's and that it is well to determine whether live spermatozoa are present in the husband's seminal fluid.

He reviews the beneficial results of the use of endocrine therapy in a number of his cases and tells what extract and how much of it he administers. Endocrine therapy may be of value also in treating men.

Psychoses and neuroses due to glandular anomalies may be inherited and there are varying degrees of these diseases as there are varying degrees of bodily ailments due to anomalies of internal secretion.

C. M. GRUBER.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Ahlstrœm, E.: Concerning the Premature Separation of the Normally Implanted Placenta (Ueber vorzeitige Lœsung der normal sitzenden Placenta: Retroplacentare Blutung). *Nord. med. Ark.*, 1919, li, Ark. f. Kir., 423.

The author's material consisted of 82 cases of premature separation of the normally implanted placenta.

PATHOLOGIC ANATOMY

In premature separation of the normally implanted placenta not followed by immediate labor there is compression of the separated part by the blood clot. According to Meyer, the loosened area has the appearance of a croupous pneumonic lung. If only a small area is loosened, pregnancy goes on, at least for a time. We find then the picture of a well-organized blood clot, dark red in color, frequently arranged in layers, covered on the uterine side with decidua and on the fœtal side with a grayish, compact capsule several millimeters in thickness consisting of compressed necrotic placental tissue.

The compression may be so severe that the covering is as thin as paper. Small hæmatomata may be accompanied by very mild or no symptoms at all. Because the surface of the coagulum is on the same level as the maternal surface of the remaining portion of the placenta, these areas are frequently looked upon as infiltrated cotyledons. The author's material contained 11 cases which showed coagula no larger than a hen's egg. If, however, larger areas are separated, labor sets in immediately and compression is rarely severe enough to produce the groove or depression in which the hæmatoma forms. The literature shows many cases in which the compression has lasted for a longer period of time, but it is remarkable how few descriptions of more recent cases can be found.

Young describes as the earliest change within the loosened area a marked congestion. Microscopic examination shows congestion of the villi which are packed closely together, the intervillous spaces being empty or filled with fibrin deposits. The microscopic picture is similar to that of red infarct and was mistaken for that by Young. The author found this marked congestion in two early cases in which it was possible to examine the tissue microscopically. The other cases may have shown it, but as no microscopic examination was made it cannot be excluded although the macroscopic appearance did not suggest it.

Ahlstrom inclines to the view of Young that the cause of the collapse of the intervillous spaces is the shutting off of the arterial circulation due to the separation of the placenta, the blood being rapidly taken up by the open veins aided by the pressure exerted by the blood clot.

LOCALIZATION

In the author's material there were 19 cases of peripheral separation. As in several there were multiple areas, the total number of peripheral separations was 24. Of these, 7 involved from one-third to over one-half of the placenta and therefore possibly might have been central in origin. In 15 the separation was central, i.e., it did not reach the edge of the placenta.

Several authors emphasize the occurrence of hæmorrhages or apoplexies within the placenta (also called red infarcts) which are generally accompanied by retroplacental hæmatomata. If they occur in numbers, they give the placenta the appearance called by Pinard and Rouhaud "placenta truffe," and according to these authors and others are due to albuminuria.

The diffuse blood suffusions first described by Jaquemier, large congested areas in which the villi are separated by coagula, are also supposed to be rather frequently associated with premature separation. The author, however, found none in 13 cases in which he examined the placenta.

Hartman has shown that small hæmatomata within the decidua on the surface of the placenta are much more frequent than hitherto believed. He found 30 such hæmatomata in 500 placentæ, their size varying from that of a small pin head to the size of a two-penny piece. At times they were situated on the surface, and at others within the substance of the decidua. Like the large hæmatomata, they were never in communication with the intervillous spaces. Six such hæmatomata were present also in 67 cases of premature separation.

The occurrence of retro- and intraplacental hæmatomata without any communication with the intervillous spaces cannot be explained in any way except by the assumption that the hæmorrhage originated in the decidua and the blood was therefore from the maternal circulation. Hartman further holds that the small hæmatomata are the beginning causes of the placental separation. In this the author agrees completely although several exceptions to the rule have been observed.

ETIOLOGY

These retroplacental hæmorrhages have been explained as due to degenerative changes in the decidua or inflammatory changes. The author's investigations, however, seem to show that degeneration or necrosis in the decidua is of very little importance in the premature separation of the

normally implanted placenta. His anatomical studies further indicate that inflammatory changes in the decidua are not a factor in the premature separation. Moreover, the clinical analysis of his material does not show that endometritis plays any rôle in its production.

During the past few years attention has been called to the occurrence of hæmorrhagic infiltration of the wall of the uterus in cases of premature separation of the placenta. Infiltrated blood is found in the connective tissue between the muscle bundles and only rarely within them. An associated œdema is also occasionally described. Williams found changes in the blood-vessels, endarteritis of the smaller vessels, and fresh thrombi in the smallest vessels and occasionally in larger vessels. Couvelaire demonstrated bursting of certain venous sinuses but no vessel change. Essen-Möller and the author also have been unable to demonstrate changes in the vessels.

The infiltration may extend through the entire thickness of the wall of the uterus. This occurred in 10 out of 24 cases. Occasionally it may be confined to the placental site. Frequently it extends to the serosa and gives the uterus a peculiar appearance, smaller or larger areas of stripes or confluent areas of bluish-red color. Ruptures through the serosa may occur and lead to severe internal hæmorrhage. In addition to this uterine infiltration, there is occasionally an associated infiltration of the broad ligaments.

Bar, Essen-Möller, and Williams hold that hæmorrhagic infiltration is usually but not constantly associated with premature separation of the normally implanted placenta and that this group is due to, and characteristic of, the pre-eclamptic state. Whether this is true or not is difficult to prove as opportunities during laparotomy and section are relatively rare. The author found this intramuscular bleeding in 3 out of 4 cases in which section offered an opportunity to observe the condition. He discusses its etiology in his consideration of intoxication as a cause of premature separation.

Special interest was taken by Ahlström in the examination of the placenta and uterus to determine whether from these local changes a common etiological factor could be established. This, however, was not possible. His own investigations as well as those of others have shown that while local changes which have been recently described also by numerous other authors do occur in certain cases they are not constant and do not occur in the majority of cases. It is possible that in certain instances they may be contributory factors.

The clinical study of the material has led to the conclusion that the cause must be sought partly in a mechanical factor exerted upon the uterus or fœtus and partly in more directly acting diseases of the mother. Among mechanical factors traumata come first. These, however, were soon realized to be of minor importance—2 to 3 per cent—though undoubtedly they are important factors in a small number of cases. Meyers believes that a trauma may initiate a severe uterine contraction, even hæmorrhage into the decidua. Seitz, however, believes that by suddenly increasing the hydraulic pressure trauma may cause a bursting. Through the sudden distention of the uterine wall, small or large areas of placenta may become loosened and hæmorrhage result.

According to Spiegelberg, psychic traumata may produce a partial contraction of the placental area.

Traction on the cord was formerly held to be of much importance. This, of course, can occur only during the expulsive stage or in other rare instances. Essen-Möller, however, found that traction on the cord will produce rupture before the placenta loosens.

Sudden evacuation of large amounts of amniotic fluid may cause a premature separation due to the suddenly diminished area of the placental site or sudden rushing of blood to the decidual vessels and their rupture.

In a few cases overfilling of the venous circulation has been advanced as a cause. Sudden straining, severe coughing, heavy lifting, etc., have been mentioned; also diseases producing venous congestion. However, care is necessary in interpreting such cases as these may be only exciting incidents whereas the fundamental cause may be overlooked.

The causes mentioned take care of only a very small number of cases and not much etiological significance may be attached to them. In all probability they are merely coincidences and in only a few cases the exciting factors.

Considerable importance must be attached to the frequent association of albuminuria, nephritis, eclampsia, and premature separation. Albumin was present in 57 of the author's 80 cases (71 per cent). In 31 cases (39 per cent) examination of the urine showed at least 1 per cent of albumin—the arbitrary differentiation point between the albuminuria of pregnancy and nephritis. This incidence of 71 per cent is contrasted with an incidence of 24 per cent among 3,002 patients delivered at the clinic in 1915. It shows how much more frequent albuminuria is in cases of premature separation. Thirty-nine per cent of the patients had over 1 per cent of albumin and in 24 per cent nephritis could be diagnosed positively whereas in the general run of cases as typified by the 3,002 cases of 1915 the corresponding figures were only 4.4 per cent and 3 per cent respectively. Essen-Möller's figure for albuminuria in premature separation, 58 per cent, is also high.

Considerable difference of opinion exists as to the part toxæmia plays in the production of premature separation. Many, however, believe that it is the most important factor. In the opinion of the author and others, premature separation, albuminuria, the nephritis of pregnancy, and eclampsia are all consequences of the same pathologic picture, i.e., intoxication. Like the hæmorrhages into the

organs (liver, spleen, kidneys, and brain) which are common in eclampsia, the diffuse hæmorrhages or infiltrations into the uterine muscle, decidua, etc., are results of the same intoxication causing premature separation. The effect is brought about not only by an increased permeability of the spongiosa vessels but also by the increased blood pressure incident to the intoxication.

It cannot be denied that many objections may be raised against the intoxication theory, particularly the objection that if the theory is true premature separation of the placenta would occur more often in the most severe form of intoxication, i.e., eclampsia, whereas this is not the case. Furthermore, premature separation with even external hæmorrhage has been observed frequently in the early months of pregnancy when intoxication and eclampsia are extremely rare.

From the author's exposition of the etiology of premature separation it is readily seen that the question is not definitely solved. His conclusions may be summarized as follows:

1. Direct traumata may cause premature separation, but are not a frequent cause.

2. Although proven in only a few cases, it is probable that lues is of etiological significance, presumably by causing changes in the blood-vessels.

3. It is not probable that local changes in the decidua, degeneration, or inflammatory changes are of any importance.

4. Many facts indicate that the intoxication of pregnancy which is the cause of albuminuria, nephritis, the pre-eclamptic state, and eclampsia, is also of much importance in the production of premature separation. Von Frankl's view that every factor causing abnormal hyperæmia, abnormal blood pressure in the spongiosa vessels, may lead to hæmorrhage and that the intoxication causing albuminuria, nephritis, and eclampsia with increased blood pressure and perhaps associated blood-vessel change also causes the premature separation is very probably correct. It is probable also that other factors such as severe trauma, psychic trauma, rapid emptying of the uterus, especially in hydramnion or twin pregnancy, and cardiac incompetence, by causing an abnormal hyperæmia or an increase in blood pressure, may be at least contributory.

SYMPTOMS AND COURSE

According to DeLee, accidental hæmorrhage which usually occurs at term, may set in at any time during the last twelve weeks. In the author's series there were 18 cases before the last three months, among them 2 of the most severe during the sixth month.

Retroplacental hæmorrhages without symptoms are frequently overlooked unless a thorough examination of the placenta is made. They are undoubtedly more frequent than reported. . Small areas no larger than a hen's egg are separated and frequently give rise to premature labor. Usually, however, some time elapses before labor sets in as is shown by the changes in the separated area and in the blood clot. In general, fœtal movements cease some time afterward and the child often dies—10 out of 11 of the author series—although perhaps some of these deaths were due to the associated albuminuria. After delivery, evidence of a premature separation is often seen, such as the passing of old blood and the immediate delivery of the placenta with old coagula.

Meyer states that whenever a separation of the placenta occurs, labor follows immediately, and this seems to be the common belief. There have been, however, cases of extensive separation in which it did not begin until several days later. The author had 16 cases in which labor set in some time after the separation as shown by the hæmorrhages. In the author's remaining 55 cases labor followed the onset of the symptoms of separation almost immediately.

Usually the symptoms begin just before the onset of labor pains. This and the fact that only 28 of the patients belonging to the group went to term, confirm the view that we are dealing with a complication of pregnancy. Also in the cases in which symptoms of separation set in after the onset of labor pains, it seems probable that the separation was primary and the cause of the onset of labor. Further proof of this is seen in the fact that many of the patients of this group did not go to the calculated time but were delivered earlier.

Cases in which the symptoms set in late during labor or toward the end of the first stage of labor are a little different. In these the separation must be looked upon as a complication of labor rather than of pregnancy. This is further corroborated by the fact that most of these cases occurred at term, although small areas of separation may have taken place without symptoms during the course of the pregnancy.

Clinically the cases may be divided into two large groups: (1) those with distinct symptoms of internal intra-uterine hæmorrhage, and (2) those without such symptoms.

The first group comprises practically all the severe cases. All authors are agreed that a patient rarely shows symptoms of intra-uterine bleeding which remains occult, that sooner or later the hæmorrhage appears externally. The author had 21 patients who showed distinct symptoms of internal intra-uterine hæmorrhage and in only one case the hæmorrhage remained occult during labor. In 8 of the 21 it remained concealed from one to fifteen hours and most of these were severe cases.

Well-developed intra-uterine bleeding shows the classical picture of premature separation. Frequently the patient who was previously well or had a history of albuminuria during pregnancy or an occasional hæmorrhage, is seized with severe pain in the abdomen. The uterus becomes distended and tense, constantly contracted, hard and sensitive, the heart tones disappear suddenly, and in a short time there are definite signs of anæmia.

If external hæmorrhage occurs, it is frequently out of proportion to the anæmia, and not rarely the picture of shock supervenes. Pinard stated that pain is rare. The author, however, found it a very common symptom. The pain probably is due to the stretching of the peritoneal covering of the uterus as a result of the tension. This may be so great that even rupture of the muscle and serosa may occur. The pain diminishes or disappears entirely after a copious external hæmorrhage. Distention of the uterus beyond its normal size is also a very common symptom. In certain cases the retroplacental hæmatoma may cause a bulging of the uterus on that side, the accessory tumor of Holmes. A very common and important symptom is the tenseness of the uterus which is constantly contracted and more or less sensitive. A change of consistency which made palpation of the child impossible occurred in 16 of 21 cases of uterine hæmorrhage.

Heart tones as a rule disappear simultaneously with the onset of the symptoms of internal hæmorrhage or soon afterward. Spaeth who saved the lives of 2 children by immediate cæsarean section emphasizes the point, however, that separation occurs gradually and the chances for saving the child are good if action is immediate. The author's material does not substantiate this. Among the cases of internal hæmorrhage, the hæmorrhage occurred in 18 before the patient was brought to the hospital. Heart tones were already absent in 14, and present in 4. Of these 4, two premature children died; in one case the patient was admitted to the hospital one hour after the onset of symptoms, two hours after the heart tones disappeared, and the full-term child was born dead. In only one case was a living child born. Therefore, it will be seen that in 21 cases of internal hæmorrhage only one child was born alive and there was only one case in which an immediate section might have saved the child's life.

The disproportion between the anæmia and the external hæmorrhage or the absence of external hæmorrhage is one of the most important symptoms. The poor general condition of the patient is not due to the anæmia alone, but also to the shock, the peritoneal irritation, and the existing intoxication of pregnancy. The external hæmorrhage is no indication of the severity of the case. Some patients may have only a serosanguinous discharge due to the coagulation of the blood with expression of the serum. This is held by some authorities to be almost pathognomonic. Labor pains as a rule are poor or entirely absent because of the distention of the uterus and the intramuscular hæmorrhages.

During delivery there is frequently a simultaneous expulsion of a large blood clot or a large quantity of fresh blood. Especially in the larger separations, the placenta is often expelled immediately after the baby. More rarely, atony of the uterus after delivery leads to severe or even fatal hæmorrhage. In the author's 21 cases of internal hæmorrhage, 4 patients had atonic postpartum bleeding. In 2 instances they were fatal, and in one, manual delivery of the placenta led to sepsis and death.

In the second large group of cases, called by the author cases of "external hæmorrhage" the characteristic symptoms of internal hæmorrhage are absent and the most important symptom is an external hæmorrhage of variable degree. The author's material comprised 39 cases, but he believes that a thorough examination of the placenta in every instance would reveal a much larger number than hitherto reported.

Hofmeier emphasizes the point that frequently the hæmorrhage does not set in until the second stage of labor, and that if it begins earlier, it continues after the rupture of the membranes. A disappearance or weakening of heart tones also occurs quite frequently in this group of cases; in certain instances followed directly by delivery it is the only symptom. The placenta also is discharged almost at once after delivery of the child, and blood clots, old or fresh, follow. Atonic postpartum hæmorrhages are not so common and in no instance were they serious among the author's cases.

The question whether the non-rupture of the bag of waters aids in checking an internal hæmorrhage or keeps it from becoming worse has been repeatedly discussed. Winter, Hofmeier, and Engstrom do not believe it does. In the author's 21 cases there was an aggravation of symptoms in 9 in spite of non-rupture of the membrane. Three of these patients died. In 8 cases in which the membranes remained intact no aggravation of symptoms occurred. The author believes that the presence of the bag of waters does not prevent an internal hæmorrhage. The incidence of the labor pains seems to play an important rôle here.

Ahlström also concludes that symptoms of internal hæmorrhage are not more frequent in cases of central separations, as is held by some authors. Goodell, Holmes, and others attribute the fact that the hæmorrhage may remain internal to the closure of the tract by some advancing part of the child. Several of the author's cases confirm this. Hartman emphasizes the point that the site of the placenta may have considerable bearing upon the amount of external hæmorrhage and points to a case in which the placenta could be palpated 5 to 6 centimeters from the internal os. The author shows, however, that even when the placenta is situated low, the characteristic clinical picture of premature separation as well as the placental changes result. He describes 6 cases in which the placenta was palpated very low down.

DIAGNOSIS

Any case of internal hæmorrhage in which there is a history of albuminuria and acute pain in the abdomen, sensitiveness of the uterus, increased volume of the uterus, tenseness of the uterus accompanied by persistent contraction of the organ, disproportion of the external hæmorrhage to the amount of anæmia, and disappearance of the heart tones, speaks for premature separation. Placenta prævia with external hæmorrhage must be differentiated, but inability to palpate the placenta excludes this with certainty.

Uterine rupture is rare during pregnancy, occurring as a rule after prolonged labor. The general symptoms may be the same, but palpation of the child outside of the uterus and internal palpation without feeling any part of the child, lead to the correct diagnosis. Hydramnion may simulate the condition but is slower in development and there is no external hæmorrhage. An acute surgical abdomen may also be confusing, but here the pain and tenderness are usually confined not to the uterus but to some other part of the abdomen. Furthermore, the temperature and a disturbance of bowel function will aid in arriving at the correct diagnosis. Moreover, anæmia is not present except in cases of rupture of an extra-uterine pregnancy.

If no symptoms of internal hæmorrhage are present only placenta prævia need be differentiated. Unless the cervix is closed, a placenta prævia is easily palpated. A placenta which is implanted low, however, cannot always be excluded and it may be necessary to observe the changes in the placenta after its delivery to make the correct diagnosis. Rupture of the sinus circularis, although rare, cannot be diagnosed with any degree of certainty, and neither can rupture of velamentously inserted cord vessels.

TREATMENT

The author has previously called attention to the rarity with which cases of premature separation with symptoms of internal hæmorrhage and unprepared soft parts are obtained for treatment while the child is still alive so that immediate, either vaginal or abdominal, cæsarean section may save both it and the mother. It is evident that a slight hæmorrhage during the later stage of labor is of considerable importance and the heart tones should be watched most carefully in order that an immediate extraction may be done. Except in such cases the child need not be considered. All authors are agreed that cases terminating spontaneously are fairly common, due to the fact that the condition is being recognized also in the milder cases. Of the author's 62 cases in which symptoms occurred during labor, 31 in which nothing was done terminated spontaneously. However, when dealing with cases in which the symptoms are urgent, there are considerable differences of opinion regarding the action which should be taken.

Tamponade is one of the oldest methods of treatment. Coclough of the Rotunda treated 43 cases with tamponade and in 42 the hæmorrhage ceased. Six of the 82 patients died and of these 2 were treated with tamponade. This was the only method of treatment when the membranes were intact. In addition, a firm binder was applied above the fundus to press the uterus against the tampon. De Lee uses a similar procedure. After rupturing the membranes and introducing a colpeurynter into the uterus, ergot and pituitrin are given, and when the dilatation is considered sufficient, manual dilatation or cervical incision is followed by extraction. The principal objection to tamponade is of course infection, and for the same reason it is objected to in other conditions.

Opinions differ also in regard to artificial rupture of the membranes. Most authors favor it. Rupture permits the uterus to contract and stimulates pains which are desirable. Meyer advocates rupture because in most instances bleeding ceases. In 51 cases Levy-Pinard had 28 which terminated spontaneously, and of the 23 in which interference of some kind was necessary, rupture of the membranes was sufficient in 16. The author had 14 cases in which the membranes were ruptured artificially and in 11 the result was favorable. In 3, the symptoms were not improved, a fact which showed that in severe cases rupture alone is not sufficient.

His conclusions are: the retention of the bag of waters intact does not check or prevent a hæmorrhage due to separation. No ill effect due to the rupture is observed, and the stimulation of labor pains by rupture frequently hastens delivery. In severe cases, however, rupture alone is not sufficient. When the condition of the mother is already serious and demands immediate evacuation of the uterus, rupture alone should not be employed. In milder cases rupture of the bag of waters should be followed by an injection of pituitrin, and if this is not sufficient, more effective means must be employed. In a minority of cases still other methods must be used and as a rule immediate evacuation of the uterus is necessary. The method to follow depends upon the condition of the mother, the seriousness of the symptoms, the condition of the cervix, and the resources at hand for the physician. The easiest cases, of course, are those in which the os is completely effaced and dilated or nearly so. In such cases immediate forceps delivery or version and extraction is done, depending on whether the head is fixed or not. A rapid delivery may also be indicated for the welfare of the child.

If the cervix is effaced and thinned out but not sufficiently for delivery, it may be incised three or four times. The cases in which the cervix is neither effaced or dilated and the symptoms do not improve after the rupture of the membranes are difficult. In such instances it is necessary to empty the uterus as quickly as possible with the least amount of risk for the mother and in this way control the hæmorrhage. Metreurysis, bimanual dilatation, or dilatation with the Bossi dilator may be employed. The first is the safer method and as a palliative measure may be used until a vaginal cæsarean or cervical incision can be done later. When immediate action is imperative, abdominal section offers the best chance to save the life of the child. At the same time it affords an opportunity to examine the uterus and to determine whether tears are present, whether it possesses contractility, etc. If necessary, it may be extirpated.

The author believes that abdominal cæsarean section is the method of choice in cases of severe or rapidly developing anæmia when the cervix is not prepared or not sufficiently prepared. In doubtful cases the indication for abdominal section may be extended somewhat, rather than limited, especially in the cases of primiparæ.

In atonic postpartum hæmorrhage, uterine tamponade has proved inefficient in many instances, and if the usual methods of control—hot irrigations, compression of the aorta, the Momberg bandage, ergot—fail, extirpation of the uterus should be done as the uterine muscle undoubtedly cannot contract. After cessation of the hæmorrhage, stimulants, salt-solution infusions, direct blood infusions, etc., are of course indicated here as elsewhere.

Former statistics show a mortality of 50 to 62.5 per cent, proof that only the severe cases of internal hæmorrhage were counted. In the author's cases the mortality was 6 per cent or, if only the severe cases are counted, 5 out of 21 (24 per cent). The prognosis for the child is poor. Fifty-eight (70 per cent) of the babies in the author's cases died; of these 30 weighed less than 2,000 grammes. Nine children were alive at delivery but not viable—a total of 67 out of 82 (81 per cent). In 21 cases of internal hæmorrhage 19 babies were born dead. Other authors report similar high mortalities. L. A. JUHNKE.

Gonnet, C.: A Case of Extramembraneous Pregnancy (Un cas de grossesse extra-membraneuse). *Rev. mens. de gynéc., d'obst., et de pédiat.*, 1919, xl, 91.

Gonnet states that only 40 cases of extramembraneous pregnancy are recorded in medical literature. He reports the case of a para-III, aged 29 years, who came to the hospital in the seventh month of pregnancy with the diagnosis of placenta prævia. The fœtus was presented by the breech. Continuous hydrorrhœa or hydrohæmatorrhœa made it very difficult to decide between a diagnosis of decidual hydrorrhœa with endometritis or an amniotic hydrorrhœa with an extramembraneous fœtus. The woman came to labor within a few weeks, a fœtus of 1,450 grams being expelled by the breech. The child, which was normally formed, died within three hours of birth. The placenta was normal and inserted marginally. The membraneous sac was quite reduced compared to the volume of the fœtus. Near its orifice it was rigid and cicatricial and had evidently ruptured many weeks before. The two membranes, amniotic and chorionic, had both ruptured at the same time and the fœtus had continued to live outside of them.

The points to which the author directs attention are: (1) the notable volume of the fœtus, 1,450 grams; (2) the absence of any malformation; and (3) the confusion of the condition before labor with placenta prævia.

In extramembraneous pregnancy the diagnosis depends upon the presence of both hydrorrhœa and hæmatorrhœa. W. A. BRENNAN.

Farmer, G.: A Case of Myomectomy during Pregnancy. *Med. J. Australia*, 1919, i, 384.

Mrs. I., a primipara, aged 31, who had been pregnant for three months, complained of intense pain in in the right iliac region with constipation which had continued for about fourteen months.

On external palpation there was felt in the right iliac region an elastic tumor the definition and characteristics of which were obscured owing to the extreme tenderness. On vaginal examination the fundus uteri could be felt pushed to the left and well above the pelvic brim. Through the right fornix a tumor was palpated which caused great pain on manipulation.

The abdomen was opened. The tumor was easily delivered through the wound and proved to be a non-pedunculated myoma growing from the anterior surface of the right cornu of the uterus. There were no adhesions. The condition of the uterus showed that the patient had been pregnant fully three months. The peritoneum was incised around the tumor 3.75 centimeters from the base, and a cuff carefully stripped away. The whole mass was then easily shelled out with a blunt dissector. A fairly deep crater was left, but the uterine cavity was not encroached upon. The muscular walls were closed by mattress sutures and the peritoneal cuff inverted. The growth removed weighed 425 grams. The patient made a perfect recovery and pregnancy continued. Labor was induced at the end of the seventh month. The patient was delivered of a healthy boy weighing 3,300 grams. The puerperium was normal and there has been no trouble since. F. H. HARMS.

LABOR AND ITS COMPLICATIONS

Schwaab: The Use of Pituitary Extract in Obstetrics (Emploi de l'extrait d'hypophyse en obstétrique). *Presse méd.*, Par., 1919, xxvii, 299.

While pituitary extract is of value in the treatment of uterine inertia in the course of labor, its use to provoke labor is absolutely improper. It has no effect in activating an abortion in progress nor does it assist in the expulsion of a retained placenta in abortion. In all of these cases the uterine musculature is too weak to be influenced by the extract.

The author is of the opinion also that pituitary extract should not be employed during the period of delivery at term. Generally it has no effect when delivery is delayed because of uterine atony without hæmorrhage; in such cases it even tends to disturb normal contractions and to produce instead contractions of Bandl's ring with incarceration of the placenta. When there is hæmorrhage at the time of delivery, pituitary medication should yield to other methods.

In the cæsarean operation Schwaab believes that ergot is preferable to pituitary extract to stimulate uterine contraction.

In postpartum urinary retention, however, the indication for the use of pituitary extract is clear. In numerous cases the contractions of the bladder are stimulated and catheterization is avoided.

Schwaab has never observed any inconvenience with the use of weak subcutaneous injections of pituitary extract, but heavy doses and intravenous injections are apt to cause nausea, delirium, cir-

culatory lipothymia, etc., in the patient and circulatory disturbances and apnœa in the fœtus. Another effect which many authors ascribe to pituitary extract is tetanization of the uterus either during labor or delivery. In Schwaab's opinion, however, this complication is exceptional when the doses given are weak. W. A. BRENNAN.

Ippolito, A.: Remarks upon the Frequency of Shoulder Presentations (Considerazione sulla frequenza delle presentazione di spalla). *Gazz. d. osp.*, 1919, xl, 137.

The statistics in regard to the frequency of shoulder presentation in obstetrics varies in different countries as shown in the following figures compiled by Cuzzi: Italy, 1.40 per cent; Austria, 0.71 per cent; France, 0.66 per cent; Belgium, 0.59 per cent; Germany, 0.58 per cent; England, 0.36 per cent; and United States, 0.35 per cent.

In the author's twenty years of professional life in Sicily he saw a shoulder presentation in only 12 of a total of 10,000 labors (0.12 per cent).

In seeking the cause of the variations in the frequency of shoulder presentations in different countries Ippolito found that the explanation must be sought in ethnical and anthropologic differences, especially in the dimensions of the xiphoid-pubic space in the different races. In other words, the frequency of shoulder presentations varies inversely as the mean stature of the race. The Italian mean stature is 162 centimeters, while that of the Anglo-Saxon in Britain and North America is about 173 centimeters. Corresponding differences are observed also in the mean xiphoid-pubic diameter measured from the base of the ensiform to the upper edge of the symphysis pubis.

The conclusions reached by Ippolito are:

1. The frequency of shoulder presentations among different peoples varies inversely as the mean stature. As the mean stature increases the frequency is less.

2. The great frequency of shoulder presentations among Italians as compared with other peoples is explained by the above law.

3. The very marked rarity of such presentations noted in one part of Sicily (Barrafranca), in apparent contradiction to the above law, is explained by ethnical and anatomical factors. In these people, who on the average are of low stature, the xiphoid-pubic line measures more than in races which are much taller.

4. The measurement of the xiphoid-pubic line is very important and in obstetrics ought to be considered nearly as important as the pelvic dimensions.

5. Obstetrics ought to follow the general tendency of the present day in according supreme importance to methods of prophylaxis. Shortening of the xiphoid-pubic line is evidence of pelvic inclination which may be the cause of abnormal presentation, and timely correction of such inclination may obviate danger for both the mother and the child.

W. A. BRENNAN.

MISCELLANEOUS

Oastler, F. R.: Some Recent Developments in Obstetrics. *Am. J. Obst.*, 1919, lxxix, 659.

Today obstetrics is a surgical procedure taught under the general principles of surgery, belonging to the department of surgery, and enjoying the careful technique given the surgical operation. With the assumption of this surgical position in obstetrics has come about the antepartum care of obstetrical patients both in the hospital and private practice.

Modern antepartum care may be summarized as follows : (1) the care of the mother, (2) a thorough examination of the pelvis, (3) a printed card given each patient which details instructions as to habits, exercise, sleep, abnormal symptoms, the adjustment of the corset, the examination of the urine, etc., (4) accurate bi-weekly examination of the urine, (5) methods for ameliorating the vomiting of pregnancy, and (6) the determination of the blood-pressure.

The author mentions, in order to condemn, so-called appointment obstetrics, a procedure conceived more for the convenience of the accoucheur than for the safety of the patient. When once a bag is introduced, the vaginal route is exposed to possible infection, and if other measures have to be taken later, cæsarean section, forceps, or version, a natural labor is made dangerous. The induction of labor by bags is an extremely useful procedure when indicated, but only when indicated, and the convenience of the mother and physician is not an indication. The baby has some right in the matter.

Rectal instead of vaginal examinations are rapidly growing in popularity. Experience has shown that internes readily acquire the necessary sense of touch to determine the presentation, and position of the child and the condition of the cervix.

In order to avoid severe laceration as far as possible, the operation of episiotomy has come into favor and justly so. Cæsarean section has also taken its proper place among the common surgical procedures of the day. It has supplanted accouchement forcé and high forceps in most cases and the operation of version in many.

That the obstetrical patient of today is better cared for than formerly is emphasized particularly in the gynecological clinics where it is a matter of common knowledge that obstetrical injuries requiring repair are far less common than formerly and that the after-care of the patients has much to do with this.

Bearing children is woman's most glorious work, but also the most serious. Consequently it is her right to be safeguarded. With obstetrics considered to be a surgical procedure and with the introduction of proper care before and after childbirth, mortality and morbidity will be lowered and physicians will receive better compensation for better work. Moreover, when the laity understands the benefits

derived, the physician's compensation will be given gladly and the careless physician and midwife will be in far less demand, possibly even cease to exist.

EDWARD L. CORNELL.

Taylor, R.: The Measurements of 250 Full-Term New-Born Infants. *Am. J. Dis. Child.*, 1919, xvii, 353.

Taylor has made an elaborate series of measurements of new-born infants. A total of 250 infants, 125 of each sex, were measured without attempt at selection other than that the babies were normal and born at term. No infant was measured before the second day nor later than the tenth, the purpose being to allow birth traumata to subside and to forestall changes due to extra-uterine growth.

The following measurements were taken: (1) total length from the vertex to the sole; (2) head and neck height—the distance from the plane of the vertex to that of the shoulder; (3) distance between the plane of the vertex and that of the navel; (4) sitting height—the distance between the plane of the vertex and that of the tuber ischii; (5) arm length from the acromion to the tip of the second finger; (6) hand length, from the fold at the base of the hand to the tip of the second finger; (7) leg length, from the great trochanter to the heel; (8) foot length, from the heel to the tip of the toes; (9) intertrochanteric diameter; (10) hip breadth — greatest distance between iliac crests; (11) shoulder breadth—distance between tissues overlying the humeral tuberosities; (12) chest circumference at nipples; (13) occipitofrontal circumference; (14) span—distance from finger tip to finger tip with arms spread; (15) trunk length—the distance from the plane of the vertex to the plane of the tuber ischii; and (16) head height—the distance between the plane of the vertex and the plane of the foramen magnum, the latter being determined by extending a line from the external canthus through the middle of the ear to the occipital region.

The apparatus used consisted of a rectangular baseboard having sideboards at two edges accurately fitted so as to make an angle of 90 degrees with the baseboard. The baseboard was covered with ruled millimeter paper over which was tacked a sheet of celluloid. Distances in centimeters from the sideboards were marked in ink on the millimeter paper. The infant was laid on the celluloid sheet with his head held firmly against one sideboard while his left shoulder touched the other.

As regards individual variation, the spread of the arms was as long or longer than the body length in 81 boys and 82 girls, 65 per cent of total. The head circumference was greater than that of the chest in 119 boys and 120 girls. The trunk length was greater than the arm length in 119 boys and 123 girls, and greater than the leg length in 123 boys and 124 girls. The arm length exceeded the leg length in 111 boys and 107 girls. In the boys the midpoint of the body lay at or above the navel in 114, and below it in 11, the extreme figures being 32 millimeters above and 10 millimeters below. It was at or above the navel in 100 girls and below it in 25. The individual measurements which form the basis of this paper have been placed on file in the Wistar Institute of Anatomy.

H. K. GIBSON

Smith, T.: A Characteristic Localization of the Bacillus Abortus in the Bovine Fœtal Membranes. *J. Exper. M.*, 1919, xxix, 451.

While making a study of the diseased membranes in cases of the infectious abortion of cattle, the writer came upon a peculiar and characteristic habitat of bacillus abortus Bang, i. e., the epithelial covering of the chorion.

This layer of cells which faces the epithelial covering of the uterine mucosa and is in intimate contact with it covers the intercotyledonous areas of the chorion and is continuous with the epithelium of the villosities of the cotyledons which dip into the depression of the maternal caruncles. The cells vary somewhat in height. The vesicular nucleus is round or oval in outline and the chromatin appears as minute spheres against the nuclear membrane, 1 μ in size. The free border of the cytoplasm is seen frequently in the form of blunt finger-like or conical projections which give the surface a fimbriated appearance. In the specific infectious disease of the fœtal membranes these cells, either individually or in series, are densely filled with minute bacilli. The invasion is recognizable under a low-power microscope in that the cytoplasm of the affected cell assumes a blue color when the section is stained in eosin-methylene blue. High-power magnifications resolve this tint into fine, short, rod-like bodies. The bacilli do not lie on the cell or in the ectoplasm, but fill the body entirely. When the microscope is raised or lowered the cytoplasm appears filled in all optical sections.

The authors believe that the significance of this invasion of the chorionic epithelium from the standpoint of pathogenesis cannot be properly evaluated until a more complete history of the successive localizations of bacillus abortus has been obtained. It is safe to assume that this particular cell parasitism is but one of a series of localizations and centers of multiplication in the fœtal membranes although evidence points to it as perhaps the earliest stage in which by rapid, unchecked multiplication the organism gains a considerable advantage over the host. The local destruction of an epithelial covering by an infecting agent when other miscellaneous infecting agents are absent may or may not be of much importance, for it depends upon the regenerative activity of the epithelium, the tendency to the gathering of injurious transudates, and the toxic substances associated with the bacilli.

G. E. BEILBY.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

O'Connell, A. E.: Roentgenography of the Kidneys. *Boston M. & S. J.*, 1919, clxxx, 495.

The author covers the subject of renal calculus very thoroughly. He believes that all calculi, except those of pure uric acid, can be demonstrated on a plate of proper quality.

In the detailed discussion of the differential diagnosis of renal calculus special stress is laid on the differentiation from gall-stones.

Pyelography should be used when renal tumor or hydronephrosis is suspected.

The roentgen diagnosis of tuberculosis of the kidney can be made only in cases which show calcified masses in the kidney shadow.

W. A. EVANS.

Judd, E. S.: Papillary Tumors of the Pelvis of the Kidney. *J.-Lancet*, 1919, xxxix, 247.

The author reviews the literature of papillary tumors of the kidney and renal pelvis and reports three very interesting cases.

In the first case papillomata were found in the bladder nine months after a nephrectomy. Most of them bulged from the left ureteral orifice but there was one, apparently a graft, which was implanted on the base of the bladder near the urethra. The histology of the papilloma of the kidney and those in the bladder was identical.

The diagnosis of this condition cannot be made definitely until operation. However, the possible presence of an adenoma of papillary type should be considered when there is pain in the region of the kidney extending to the loin, rapid emaciation, a palpable tumor, and hæmaturia.

The treatment is nephrectomy and complete ureterectomy.

J. S. EISENSTAEDT.

BLADDER, URETHRA, AND PENIS

Lewis, B.: Some Phases of Operative Cystoscopy. *Internat. J. Surg.*, 1919, xxxii, 129.

The author summarizes the value of operative cystoscopy and the use of radium, intensive X-ray treatment, and fulguration in cases of carcinomatous growths of the bladder.

Conditions requiring such instrumentation include chiefly obstructive processes at the neck of the bladder, vesical growths and foreign bodies, including stone, and ureteral constrictions and calculi.

Two cases of carcinomatous tumor of the bladder treated successfully with radium and fulguration are reported:

Case 1 was that of a woman 54 years of age who complained of unduly frequent and painful urination associated with hæmaturia which had continued for three years. Cystoscopy showed the presence of a villous papilloma on the left wall of the bladder including the left ureteral orifice. The pathological examination of a piece of tumor tissue showed it to be a well-defined malignant papilloma.

The growth was treated with electric fulguration (bipolar current) and a week later with twelve hours of 50 milligrams of radium element which was repeated in three months.

Shortly after the last radium treatment cystoscopy showed that a small ulcerated area was all there was left of the former growth. At this time, however, another small tumor was seen anterior to the site of the older growth. This also was fulgurated and about a month later the vesical mucosa was found to be absolutely clear of all evidence of both tumor and ulceration. Apparently there had been complete restoration of health, both local and general. Subsequent reports received after two years have indicated a continuation of this satisfactory outcome.

Case 2 was that of a woman who weighed only 95 pounds and who was apparently in the last stages of decline. Lancinating pain demanded the hypodermic injection of 1½ grains of morphine daily. The bladder was two-thirds full of a carcinomatous growth. Similar treatment to that used in the first case gradually and progressively reduced the tumor to a mere ulcerated area the size of the finger nail. Coincidently there was a general improvement in the patient's health and her weight increased to 135 pounds.

In these cases 50 milligrams of the radium element was applied in a capsule enclosed in a black rubber cover to which was attached an ordinary rubber catheter for introduction. The exposures lasted from eight to ten hours and were repeated twice or three times according to the reaction obtained.

In the author's opinion, the radium and X-rays weaken the resistance of the growths and in this way make them more amenable to the direct assaults of fulguration.

Prostatic carcinoma offers distinctly less opportunity for cystoscopic therapy and limits the surgeon to three measures which, though not presenting any certainty of permanent relief, in numerous instances afford a surprising and extended immunity from suffering.

By suprapubic prostatectomy most of the carcinomatous tissues and obstructing material can be removed, leaving a good channel for urination. During and after convalescence from the operation, prophylactic measures against the return of the growth should be taken. These consist of the ap-

plication of the radium element or emanation through the suprapubic wound and successive exposures to intensive X-ray treatment.

Foreign bodies in the bladder, such as hairpins, pieces of straw, etc., may be grasped and removed by means of the operating cystoscope and appropriate accessories. Success in removing calculi depends mainly on their size and density. When they are small or of such soft and phosphatic material as to make them fragile, they may be reduced by successive bites with the bullet forceps to a size which permits their removal through the sheath of the cystoscope or even by dragging them together with the sheath telescope and forceps.

In cases of contracture at the vesical neck an operative measure which has given much satisfaction is the use of the electro-incisor. This is of value, however, only in the contracture form of prostatic obstruction and is not supposed to supplant prostatectomy which is demanded in cases of hypertrophic obstruction. Actuated by the d'Arsonval (bipolar) current, it is capable of burning a deep groove through the offending ring at the neck of the bladder under the direct vision of the operator. The following case reports illustrate its use:

Case 1. The patient was a man 64 years of age. On admission for treatment it was found that the bladder had been drained by means of a catheter introduced through a suprapubic puncture a month previously. The low specific gravity of the urine and the small phthalein output indicated that the kidneys were involved and any radical measure would be dangerous.

The drainage was continued by the author by means of a catheter in the urethra which was well borne. When sufficient recuperation had been attained, the prostatic incisor was used, the deep growth being burned through the neck of the bladder posteriorly. There was no hæmorrhage, chill, or fever. The results were striking. Three days after the operation the patient was able to pass urine in a fine stream, emptying the bladder. This operation was performed in October, 1917, and prostatectomy has not been considered since.

Case 2 was a case of contracture of the neck of the bladder with marked infection and symptoms of uræmia. The patient was a man aged 60 who complained of excessive frequency of efforts at urination. The urine was decreased in quantity, highly colored, very clouded with pus, and contained some blood. The residual urine amounted to from 7 to 12 ounces. No enlargement of the prostate was apparent on rectal palpation or cystoscopic examination. The urinary obstruction and residuum continued in spite of repeated postureteral dilatation and irrigation. Fulguration with the prostatic incisor was then resorted to. There was no reaction, chill, or fever, and the patient has had no urinary trouble in the past year.

Case 3. The patient was a man aged 55 years. For two years there had been undue frequency of urination. At the time of examination the bladder was distended and contained 26 ounces of residual urine. The prostate was normal, and there were no signs of tabes or lues. Cystoscopy revealed that there was a contracture at the neck of the bladder.

The fulguration with the prostatic incisor was done and repeated three times during the following month. Since then the patient has recovered his good health and urination has been normal. Repeated tests have shown that the residual urine amounts to only from ½ to 1 ounce.

Case 4 was that of a man aged 70 years who complained of undue frequency of urination which had continued for the past two years. Examination failed to show hypertrophy but contracture of the vesical neck was indicated. There was residual urine in amounts varying from 3 to 5 ounces. Dilatation, massage, and irrigation, resulted in only temporary improvement. The constricted vesical neck was then fulgurated with the incisor, this treatment being repeated four times. Urination finally became free, easy, and markedly less frequent. There was no residual urine. The favorable condition has continued.

The conclusion from these cases is that in appropriate conditions, particularly contracture without prostatic hypertrophy, electric fulguration offers a safe and sane method of enlarging the cervical urethral outlet for better urinary drainage and is without attendant danger from bleeding, sepsis, and other objectionable consequences.

General anæsthesia is never necessary. Local anæsthesia is induced by sacral injection (caudal anæsthesia) or by the direct application of a local anæsthetic through the author's urethral depositor.

Fulguration to obtain a deep groove that widens the outlet may be repeated when necessary.

The author reports an interesting case of the use of cystoscopy in diverticulum of the bladder. The patient was a man 73 years of age who for ten years had had accumulating "bladder troubles." Previously a suprapubic prostatectomy had been performed but without a preliminary cystoscopy. Although the suprapubic wound healed satisfactorily, there was no relief from the "bladder trouble."

When examined by the author, it was found that 8 ounces of residual urine, rank and decomposed, was left after voluntary urination. Cystoscopy showed the orifice of a large diverticulum. A radiogram made after the injection of a 15 per cent sodium bromide solution showed the presence of an adventitious sac with a cavity fully as large as the cavity of the bladder.

Suprapubic removal of this sac was followed by prompt recovery and entire relief from further symptoms.

In discussing ureteral stricture the author cites two cases as object lessons of the results of incorrect diagnosis. In the first case the postmortem examination showed destruction of the kidney due to the

obstruction, backward pressure, infection, and suppuration which had been induced by the stricture of the ureteral orifice. The second case was that of a man who had been more or less of an invalid for fifteen years, subject to chills and fever for long periods, and treated for malaria, tuberculosis, and "latent gonorrhœa" without success. Cystoscopy showed yellow pus oozing through the wall of the bladder at a point where the left ureteral orifice ought to be. No urine was at any time obtained from that side. After several examinations it was proved that the left kidney, instead of being a solid tumor, was an enormous pus sac, tense and rigid and absolutely beyond any functional capability. On nephrectomy no cause for the destruction could be found beside the pinpoint constriction at the ureteral orifice. Removal of the kidney was followed by complete recovery of the general health.

The author then discusses cases of ureteral stone. When the stone is blocked higher up in the ureter the first endeavor after the establishment of the diagnosis should be to dilate the ureter below the stone. Before this is thoroughly accomplished, it is decidedly bad judgment to try to grasp the stone in order to remove it directly.

While the method of direct removal with the forceps may seem more gratifying to the patient, success is much more frequent with the more gradual and less spectacular methods of repeated dilatation of the ureter, descent of the stone, and its final expulsion into the bladder from which it is removed either by voluntary urination or by the cystoscope.

A stone of very large size is recognized as being impossible to deliver by cystoscopic measures and therefore falls within the province of the open surgical operation. It should be borne in mind, however, that such operations are attended by serious risks and therefore should be avoided if possible.

Glycerine, liquid albolene, papaverin solution, and other agents have been recommended and used in connection with the catheter for assisting in the removal of a stone but experience has shown that not much reliance should be placed upon them except as adjuvants.

To differentiate a stone from a phlebolith the author recently discovered another method which seems useful. A radiogram taken with an ordinary X-ray catheter displayed a shadow apparently in contact with the catheter. As a further test another radiogram was taken, this time with metal forceps passed well into the ureter. The forceps being more rigid than the catheter used previously straightened out the curve and plainly showed the separation of the shadow from the line of the ureter.

At the close of his article the author describes a ureteral syringe devised by Moore and Lewis, which consists of a glass tube with a rubber bulb. This syringe is convenient for sterilizing and can be easily attached to a ureteral catheter of any size.

THEODORE DROZDOWITZ.

Cahill, G. F.: Bladder Perforations Seen at the Front. *Internat. J. Surg.*, 1919, xxxii, 113.

In the recent war, wounds of the bladder were all classified as abdominal perforations and in the evacuation zones constituted between 3 and 7 per cent of the total number of the latter type of injury. Undoubtedly on the battle field this percentage was higher, but when the close proximity of the pelvic vessels is considered, it is evident that extensive lacerated wounds in the vicinity of the bladder were apt to be followed quickly by a fatal hæmorrhage.

The causes of wounds of the bladder were practically the same as those of all other war traumata. The largest number of such injuries were due to fragments of high explosive shells, and the second largest group, to either rifle or machine-gun bullets. A few such wounds were caused by shrapnel balls or fragments of grenades. Bayonet wounds of the bladder were an extreme rarity in the hospitals.

Perforations of the bladder occurred from any angle, cases having been observed in which the missile had traversed the chest and abdomen, the back, the hips, the thighs, and the perineum. Since a large proportion of all wounds were received while the men were in the prone position, a large number of the injuries of the bladder were lateral or posterior perforations.

All vesical wounds were either intra- or extraperitoneal. The intraperitoneal group were associated with other visceral injuries, the most frequent being traumata of the small intestine or the pelvic colon. The outstanding feature in these cases was the injury to the intestinal tract, and upon this the immediate outcome depended. Intraperitoneal wounds were more common than extraperitoneal wounds.

The sooner operation is performed after the injury the better the chances for success. Statistics based upon large numbers of cases show that a patient with intestinal perforation rarely recovers if operated upon later than twenty-four hours after the receipt of the injury.

If operative treatment was determined upon (and this necessitated good judgment), the procedure adopted was that mapped out by those whose knowledge had been gained from long experience with abdominal injuries.

The chief features of the procedure were: (1) a large incision, (2) free exploration of the peritoneal cavity, (3) thorough systematic and rapid inspection of all viscera before any repair, (4) rapid and complete repair of all injuries if possible, (5) extraperitoneal repair of the bladder wound with separate closure of the peritoneum, (6) removal of all foreign material, (7) mopping out of the peritoneum, and (8) closure of the abdominal wound with drainage. It was found best to close the bladder tight if possible and drain it through a catheter, either continuously or intermittently. Wounds of the base of the bladder that were difficult or impossible to close were drained suprapubically.

Extraperitoneal wounds of the bladder were less common and comparatively easier to diagnose and

treat. When seen early, the men having this type of wound were unable to urinate or perhaps passed only small amounts of bloody urine. In some cases urine leaked from the wound. However, there was no peritoneal irritation. When seen later, they presented the picture of extravasation of urine with a large hæmatoma or the beginning of a urine-containing abscess.

In recent cases, repair of the bladder wound after removal of foreign material and contaminated or devitalized tissue and drainage through a catheter either continuously or intermittently gave good results.

Wounds of the bladder and rectum were all treated by suprapubic drainage. It was claimed by the French, especially Legueu, reporting from a French base hospital, that it was better not to repair the rectovesical opening early if it was not in communication with the peritoneum. It was asserted also that these wounds did better if well drained; that a larger number of rectovesical fistulæ closed, and if they did not close, a later plastic operation was preferable. If the bladder, rectum, or pelvic colon was injured, thus involving the peritoneum, the case was treated as an intestinal perforation with repair of the gut, drainage of Douglas' pouch, and suprapubic drainage of the bladder.

In summing up, the fact upon which particular emphasis was laid was that in all vesical wounds the bladder is not the danger point but that the mortality both early and late depends upon the damage to the associated structures.

V. D. LESPINASSE.

Buerger, L.: The Direct Visual Method in the Treatment of Filiform Strictures of the Urethra. *N. Y. M. J.*, 1919, cix, 798.

The author's universal urethroscope consists of a straight endoscopic tube, two obturators, a light carrier, a telescope, and a magnifying window. The straight tube is longer than that of the ordinary urethroscope (7¼ inches) so as to be available for work in the bladder as well as in the urethra. Near the ocular end, a large catheter outlet of the type used in the author's operating cystoscope is fused into the tube. Through this, special operating devices, such as rongeur forceps, fulguration electrodes, filiform and larger bougies, catheters, and applicators may be passed. The endoscopic tube is reinforced at the ocular end by a flange and admits the light carrier with a watertight joint. Two faucets also fit into the cuff. These give entrance and exit to fluid for the distension of the urethra which improves the clarity of the visual field and aids in the manipulation of the instrument. The two sizes of endoscopic tubes which have been found most useful, Nos. 24 and 25 French, are provided.

In order to convert the telescopic instrument into an air-inflating instrument, an Elsner-Braasch cystoscope, or an ordinary straight tube urethroscope, a magnifying window is provided which serves not only to close the tube for air-inflation or water-distension, but also to magnify the direct picture slightly and obviate the necessity for accommodation of the eye at so close a distance.

In short, the instrument is universal in that it combines the uses of the following: (1) an open-air anterior and posterior urethroscope; (2) an air-inflation anterior and posterior urethroscope; (3) a direct telescopic cystoscope (to replace the Brown); (4) a direct telescopic operating cystoscope; (5) an operating, irrigating, anterior and posterior, non-prismatic telescopic urethroscope; (6) an Elsner-Braasch urethroscope and cystoscope, and (7) a Kelly or Luys endoscope and cystoscope.

This universal cysto-urethroscope is recommended chiefly as an irrigating telescopic instrument for the bladder and the posterior and anterior urethra. The technique of its use is as follows: the sheath fitted with the curved obturator is introduced into the bladder, the obturator removed, and the bladder irrigated if necessary. The light carrier and the telescope are now locked in place and the irrigating fluid allowed to flow through one of the faucets, a rubber tip or cap having been adjusted at the catheter outlet. The trigone, ureters, bas-fond, and posterior wall of the bladder may be adequately illuminated and brought into view and the examiner may then proceed with the examination of the neck of the bladder and urethra.

For those who employ the direct cystoscopic method by preference, both ureters may be catheterized according to the well-known principles of manipulating non-prismatic cystoscopes. When the neck of the bladder and urethra are to be examined with the water flowing, the instrument is slowly withdrawn, a periscopic view of the urethra being obtained. As soon as the membranous urethra is brought into view, it is well, while manipulating the cysto-urethroscope with the right hand, to grasp the penis with the left hand in order to prevent reflux of the irrigating fluid. The degree of dilatation of the urethra is controlled by both the height of the irrigator and the patency of the irrigating faucet.

In the treatment of filiform stricture the obturator designed for the anterior urethra is inserted with the patient in the usual cystoscopic position, and the sheath then introduced until it meets the resistance of the strictured area. The obturator is then removed and the telescope with the filiform bougie in place is inserted. While the assistant grasps the corpus cavernosum of the penis to prevent reflux, the irrigating fluid is allowed to distend the urethra. The orifice of the stricture is now sought and can often be clearly demonstrated as a sharply defined black hole, centrally or excentrically placed. At times it is obscured by a shelf of scarred mucous membrane. By manipulating the filiform bougie back and forth, like a ureteral catheter, and by movements of rotation, it can be readily made to enter the stricture and the bladder. The screw end of the bougie is now held or pushed inward and the telescope withdrawn. The sheath

or endoscopic tube is then removed, care being taken not to dislodge the bougie. Further procedure is according to the well-known principles of dilating strictures. THEODORE DROZDOWITZ.

MISCELLANEOUS

Stevens, A. R.: Experiences in France with Surgery of the Genito-Urinary Tract. *J. Am. M. Ass.*, 1919, lxxii, 1589.

Stevens' paper deals with the frequency of gunshot wounds of the urinary tract and his personal experiences in genito-urinary surgery during the recent war.

The author was impressed with two facts concerning war wounds of the urinary tract: first, the relatively small number of cases in the hospitals, and second, the high mortality. With reference to the frequency of these injuries, he states that various groups of statistics show that the kidney is involved in from 4 to 9 per cent of penetrating abdominal wounds, and the bladder in from 4 to 7 per cent.

In the recent war the mortality of patients with wounds of the urinary tract was very high. According to a French publication giving collected statistics, non-complicated bladder wounds resulted in a mortality of 56 per cent. Stevens' experiences seem to corroborate this figure. He has a record of eleven patients who reached a base hospital with vesical wounds or wounds adjoining the bladder, of whom, to his knowledge, at least six died.

The high mortality of vesical injuries is due, not only to the intraperitoneal and pelvic complications, but also to wounds in other parts of the body which handicap the patient seriously and materially reduce his chances for recovery. Of four patients wounded through the perineum who came under the author's observation only one recovered.

In the treatment of suprapubic wounds, it is advisable to close a wound of the bladder which is on the peritoneal surface, but to drain an extraperitoneal opening. Attention is called to the necessity for removing all loose bits of bone in complicating fractures of the pelvis.

The author has seen eighteen or twenty cases of bladder complications of gunshot wounds of the spine. The treatment resorted to consisted of infrequent catheterization, suprapubic drainage, and the "do nothing" plan. He is convinced that the last method is not of universal application. The harm done to the kidneys by a continuously large amount of residual urine in the bladder probably represents a smaller risk than that of urinary infection from repeated catheterization.

The article contains several interesting case reports. H. L. KRETSCHMER.

Luys, G.: War Wounds of the Genito-Urinary Organs. *Med. Rec.*, 1919, xcv, 734.

In summarizing his experience in the urological service of the military hospital Dominique Larrey, Versailles, the author treats the genito-urinary organs individually, giving full case reports.

WOUNDS OF THE URETHRA

When the patient arrives with extensive damage to the urethra and there is difficulty of urination, the first thing to be done is to deviate the urine by hypogastric section. This prevents the urine from reaching the infected focus, thus permitting a more rapid cicatrization of the wound, and protects the patient against continued suffering at the time of micturition. In consequence of such deviation of the urine, plastic operations performed on the urethra are more apt to be successful than if a permanent catheter is used.

Regarding the operative procedures for the radical cure of pubic or scrotal fistulæ following war wounds, the author has found that the method of Duplay undoubtedly offers the best security.

Another method which has been advocated for urethral fistulæ is cutaneous inversion. This, however, seems to yield favorable results only in cases of small fistulæ. Still other procedures in the form of autoplastic operations with flaps or transplantation of the mucosa may be employed in suitable cases. In the course of such procedures great care should be observed in the matter of intra-urethral manipulations. Unless a hypogastric section has been performed for the deviation of the urine, the catheter should not be left in situ but intermittent vesical catheterization (four or five times in twenty-four hours) should be done.

Under all circumstances, and when the operative procedures have led to closure of the urethra, it will be necessary later on to restore the caliber of the canal by means of gradual systematic dilatation with sounds.

Wounds of the deep urethra are more difficult to cure and require multiple interventions. In such cases a deviation of the urine should be effected by the suprapubic route in order that the urethrorectal fistula may be treated under more favorable conditions.

Various procedures have been advocated for the cure of urethrorectal fistulæ. The most simple consists in liberating the rectum from the deep urethra through a long perineal incision and then suturing the urethral and rectal gaps separately.

Another method consists in lowering the rectum so as to make possible a complete separation of the fistulous rectal segment, then shifting the rectal wall as a whole in such a way that only a perfectly healthy portion of the rectum lies opposite the urethral gap.

A most interesting operation proposed by Rochet of Lyons is the ischopubic separation of the insertion of the middle perineal aponeurosis to gain access to the wound.

WOUNDS OF THE BLADDER

Most frequent among wounds of the genito-urinary tract are injuries of the bladder and urethra.

Vesical wounds may be uncomplicated or associated with lesions of the neighboring organs.

Almost invariably bladder wounds are combined with fractures of the bony pelvic girdle, particularly fractures of the pubis, or with perforations of the intestines. In such cases the wound in the bladder is secondary and is relegated to the background by the symptoms of peritonitis which accompany the intestinal injuries. Adhesions develop and the patient may void urine from points at a great distance from the bladder. Of three patients under the author's observation, one passed urine through an opening in the upper part of the right thigh while in the other two cases it was passed from an orifice on the posterior aspect of the buttock.

Wounds of the bladder may sometimes remain undetected and therefore a very careful search should be made for them. The most important consideration in the treatment is the establishment of adequate urinary drainage. The diagnosis of the condition having been established, it is necessary first to locate the opening into the bladder in order to introduce a drainage tube.

On account of the associated lesions in war injuries of the bladder, primary suture of the wound rarely seems practicable. Drainage is the only alternative, and for this the anterior median route is best.

Among the complications which may arise is the presence of bony splinters due to fracture of the pelvis which enter the bladder and after the closure of the wound may form the nuclei of vesical calculi.

The arrest of projectiles in the interior of the bladder is relatively rare. Only a combination of exceptional circumstances permits the observation of such cases for as a rule projectiles pass directly through the bladder, perforating its wall and frequently also the rectum. However, since simple penetration of a bullet into the bladder undoubtedly occurred in one case, it is permissible to assume that there are other cases of the same kind. The dangers threatened by foreign bodies left in the bladder are well known for they invariably become incrusted with lime salts and serve as nuclei of vesical stones. The presence of foreign bodies in the bladder must therefore be ascertained. This can be done with an ordinary explorer or metal sound or still better, with the cystoscope. The author's "direct-vision" cystoscope makes it possible to see and localize a foreign body accurately, to seize it under the control of the eye, and extract it rapidly.

WOUNDS OF THE KIDNEY

Gunshot wounds of the kidney are relatively few and may be simple or associated with lesions of other organs. When the kidney is only incidentally damaged by a projectile which injures other abdominal organs, laparotomy becomes imperative.

When the wound is limited to the kidney, a distinction must be made between several varieties. In some cases the projectile has passed through without causing any appreciable permanent lesions. Hence, when there is reason to suspect a renal wound expectant measures are in order before surgical interference. In favorable cases the originally profuse hæmaturia will subside progressively. However, when there is severe perineal hæmaturia, indicated by thickening in the lumbar region, a radiograph should be taken. If the presence of a foreign body is discovered, intervention is necessary.

Operative indications in the course of war wounds of the kidney are positive also when the renal hæmorrhage, instead of stopping, becomes aggravated or when the kidney presents a well-marked pyonephrosis. In cases of secondary pyonephrosis, the treatment is the same as in pyonephrosis due to any cause, interference with the diseased kidney being permissible only when its fellow has been found, by segregation of the urine, to be perfectly healthy and able to care for the entire excretion of urine.

WOUNDS OF THE TESTICLE

Gunshot wounds of the testicle are not uncommon. As a rule, they are associated with other lesions of the urethra or the bony walls of the pelvis, and frequently are accompanied by wounds of the thighs. In exceptional cases the injury is limited to the testicles alone. The treatment to be adopted in this class of injuries must be pre-eminently conservative unless the organ has been completely destroyed and its preservation is absolutely impossible.

The utmost care should always be exercised to preserve, if not the entire organ, at least the larger portion of it. In other words, castration should be performed rarely and only as a last resort. In this connection, the author cites the case of a young soldier, 23 years of age, who was wounded by a bullet which passed through both testicles in such a way that after the wound had healed only two small stumps were left, evidently without any testicular secretion. In consequence of this injury, the patient sank into a state of extremely pronounced neurasthenia, with mental, moral, and physical depression of a very marked type. No internal treatment proved successful in restoring his previous state of health.

THEODORE DROZDOWITZ.

Timme, W.: A New Pluriglandular Compensatory Syndrome. *Med. Clin. N. Am.*, 1919, ii, 959.

The author describes a syndrome which he attributes to disproportionate function of the thymus, the adrenals, and the pituitary glands. The condition begins some years before puberty and presents largely the characteristics of the so-called status thymicus-lymphaticus. In the author's opinion this is due mainly to hypofunction of the pituitary and other endocrine glands, but a hyperfunction of the thymus.

During the second stage, which is ushered in at puberty or some time after puberty normally

occurs, the symptoms and signs become more marked and the growth of the body is very rapid. This increased growth, Timme believes, can be explained by the assumption of Tandler and Gross that there is either a deficiency of the gonadal inhibition to growth or "thymic giantism." The great fatigability, the low blood-sugar content, the low blood-pressure, and the white line of Sergent he credits to a deficient adrenal chromaffin system.

With the third stage, at about the twentieth year of life, a compensatory change begins and is completed at the fourth stage from three to ten years later. The compensation is then complete or the untreated case takes on the attributes of the condition due to enlargement of the pituitary body following the earlier manifestations of the thymic state. In the former condition the acromegalic features are retained, but the blood-pressure and blood-sugar have returned to normal and the headaches and fatigue have disappeared; in the latter, the headaches, the fatigue, and other symptoms gradually become more severe. These changes are due presumably to hypertrophy of the pituitary gland, an assumption which the author substantiates by X-ray findings.

Timme has found that adrenalin is valuable to tide the patient over exceptionally bad days of fatigue and exhaustion, but the prime agent, which is almost a specific, is pituitary gland extract in one of its varied forms. This is valuable not only in the third stage, but also when there is no compensation by hypertrophy of the pituitary body.

Case histories, photographs, and X-ray plates illustrating the various stages of the syndrome are given. C. M. GRUBER.

Hinman, F.: The Cystoscopic Study of Urologic Conditions in Children. *Am. J. Dis. Child.*, 1919, xvii, 305.

Abnormalities of the urinary tract in children apparently are not prevalent, and accurate methods of diagnosis are almost universally neglected.

In recent years the perfection of small-caliber instruments has made possible the direct application to the field of urology in children all of the knowledge and experience gained in the development of general urology during the last twenty or twenty-five years. It is a simple procedure to cystoscope the bladder and catheterize the ureters of girls of any age, and of boys over 4 or 5 years old. For little fellows under 4 an external urethrotomy, which is not mutilating or dangerous, permits the examination.

The author emphasizes the value of the simple X-ray examination in children to show the size and shape of the kidney.

Of twenty-six children in whose cases a cystoscopic examination was made, the youngest boy was 3 years old and the youngest girl 11 months. Of twelve girls with pyuria examined cystoscopically, the youngest was 11 months and the oldest 14 years of age. Six of these cases were acute or subacute infections and six chronic. In three of the acute and three of the chronic cases the infection was limited to the bladder; microscopic and cultural studies of the catheterized kidney urines were negative. In all twelve cases there was cystoscopic evidence of bladder inflammation. In the six cases of pyelitis the infection was confined to the left side in two and was bilateral in four. The total of the phenolsulphonephthalein was normal in all. In other words, of twelve cases of clinical pyelocystitis, simple cystitis was present in 50 per cent, bilateral pyelitis and cystitis in 33 per cent, and unilateral pyelitis with cystitis in 16 per cent. Bacillus coli communis was cultivated from the urine in all but one case in which a pure culture of staphylococcus was obtained. In all of the ureteral catheterizations silver nitrate in strengths of from ¼ to 2 per cent was used as a pelvic lavage before the withdrawal of the catheters.

The quick and remarkable benefit following silver nitrate lavage of infected kidneys is worthy of attention. The procedure takes from five to ten minutes, and as it is done under primary gas and oxygen anæsthesia, without trauma or other bad effects afterward, no hesitancy is felt in strongly advising this logical method in cases resisting ordinary methods of treatment.

The author has diagnosed also renal tuberculosis, nephrolithiasis, congenital posterior ureteral valve, bladder stone, and urethral stone in children under 5 years of age.

In conclusion he states that it is technically possible to apply modern cystoscopic methods to a child of any age. V. D. LESPINASSE.

SURGERY OF THE EYE AND EAR

EYE

Török, E.: Tuberculin in the Diagnosis and Treatment of Eye Diseases. *Arch. Ophth.*, 1919, xlviii, 242.

This paper is well summarized in the following conclusions:

1. An eye condition should be considered tuberculous only when a positive focal reaction has been observed.

2. When a positive focal reaction cannot be obtained, but the patient shows a positive general and local reaction, and other possible causes for the eye condition are excluded, the case may be considered as probably of tuberculous origin.

3. For diagnostic and therapeutic purposes tuberculin should always be used in fresh solution.

4. For diagnosis in eye conditions only the subcutaneous injection is of value.

5. Tuberculin is a valuable remedy in ophthalmic therapeutics provided it is used in eye affections in which a positive focal reaction has been obtained.

6. The treatment should be continued for a long time.

7. Scleritis, deep and interstitial keratitis, and iridocyclitis are closely related to each other and are not eparate entities. That they may change from one to the other is a clinical observation borne out by the pathologic findings of Treacher Collins.

8. Exudative choroiditis is seldom of tuberculous origin, the source of infection being usually the teeth. S. S. Howe.

Grout, G. H.: Experiences in Reparative Surgery after War Injuries of the Eyes. *Arch. Ophth.*, 1919, xlviii, 227.

The problem of late restorative work on the eye is fully as, if not more difficult to solve than, that of an operation performed early, as the original operation must be repeated after the formation of scar tissue. For operations of this kind the anæsthetic recommended is novocaine-adrenalin solution as most of the work is for cosmetic purposes and the patients stand the pain better than the after-effects of ether.

In coloboma of the lids the procedure of Blaskovics was generally followed.

In severe laceration of the eye-ball it sometimes happened that scleral tags were driven into the orbital fat and not removed when enucleation was done without due care. These afterward caused pain and necessitated a secondary operation.

In 300 enucleations no cases of sympathetic ophthalmia were seen.

In cases of retracted ectropionized lower lids the epithelial inlay of Esser was used. This consists in implanting a dental plaster mold covered with egg albumin and a Thiersch graft into the cavity formed by excising the scar tissue, suturing the skin over it, and in ten days, when the mold is removed through an incision from the conjunctiva, immediately inserting a prosthesis to maintain the cavity.

Gilles of London uses what is called an "epithelial outlay" in cicatricial ectropion of the upper lid. The mold covered with a Thiersch graft is sutured in the cavity formed by excising the scar tissue as in the Esser procedure and removed through the original skin incision ten days later, the epidermized cavity being allowed to flatten out and the lid consequently to drop. S. S. Howe.

Schweinitz, G. E. de.: Concerning Concussion and Contusion Injuries of the Eye in Warfare. *Am. J. Ophth.*, 1919, ii, 313.

Routine examination of the eyes of wounded soldiers has often revealed elaborate retinochoroidal and vitreous changes when there were no external manifestations of injury. Bonnet is quoted as explaining such a condition by the statement that the driving of the blood column into the small vessels of the eye may rupture them and cause varying degrees of injury.

It is interesting that in severe concussion resulting in commotio retinæ vision may be completely lost for several days.

Prolonged hypotony sometimes occurs after contusion, but marked reduction in intra-ocular tension does not necessarily mean perforation of the globe.

Concussion sent through the maxillofacial area of one side and causing ipsolateral ocular lesions is probably prevented from affecting the other eye by the accessory sinuses which do not transmit the shock to the other globe.

The difference between concussion changes of the fundus in civil and in military practice is due in great measure to the fact that under ordinary circumstances the blow is delivered by an object which is moving comparatively slowly while in warfare the object moves rapidly.

There is a striking analogy between the mechanism of concussion injuries of the eye and those of the brain. S. S. Howe.

Vail, D. T.: Types of Orbital Abscess and Exophthalmos Due to Intranasal Suppurative Processes. *Laryngoscope*, 1919, xxix, 263.

In the cases of orbital abscess seen by the author the condition was due to direct extension of the suppurative process from an empyema of one of the accessory nasal sinuses through an actual gross de-

fect in the orbital wall adjoining the involved sinus. He contrasts this finding with the old conceptions of metastatic abscess due to a septic embolus, and of "septic thrombosis."

A sinus empyema may discharge its contents by any one of three routes: (1) through its blocked nasal ostium, the most usual occurrence; (2) through the wall of the cerebral fossa, producing an extradural abscess; and (3) through the wall of the orbit, producing an orbital abscess. As the pus under pressure in the sinus breaks through the orbital wall, it first elevates and later bursts through the periosteum into the orbital tissues.

The condition described produces a striking clinical picture the essential features of which are a deep boring pain, chill, prostration, high temperature, and exophthalmos with œdema of the eyelids. The position of the proptosed eyeball usually indicates which sinus was the seat of the primary abscess.

The author reports four cases in which the orbital abscess was produced respectively by empyema of the sphenoid sinus, the posterior ethmoid cells, the anterior ethmoid cells, and the frontal sinus. The autopsy findings in two fatal cases are given and the operative findings in all four. W. F. MONCREIFF.

Gougelmann, P.: From the Standpoint of the Artificial Eye Maker. *Arch. Ophth.*, 1919, xlviii, 268.

Before inserting a permanent prosthesis, a temporary eye should be worn for a fortnight before the fitting is made. It should be remembered that a small eye is less disfiguring than an eye that is too large.

Ordinarily an eye can be worn comfortably for one year, but instances are known in which one has been worn for twenty years without removal.

Acid conditions of the system cause a crystalline deposit that makes the eye as rough as a file or causes a discoloration of the sclera. The latter, however, can be removed by a peroxide bath.

A mold of the socket such as is often suggested is not practical because the eye is made by hand and the contour of the mold cannot be identically reproduced.

The disadvantage of the gold or glass ball implantation is that it sets too far forward and requires too thin a prosthesis. Fat implantation seems to be the best solution of the problem of furnishing a movable stump as in one case of ten years' standing it was found that the fat was not absorbed.

S. S. HOWE.

Alling, A. N.: Fat Transplantation into Tenon's Capsule after Enucleation. *Arch. Ophth.*, 1919, xlviii, 263.

Although fat is of relatively low vitality, it is almost invariably retained and becomes organized when implanted into Tenon's capsule after enucleation. It shrinks to a certain degree but never to less than one half its original size, and a sufficiently large stump remains permanently so that the artificial eye is not sunken and has considerable motility. When too much fat is used the conjunctival sutures may give way. In a short time, however, the exposed tissue becomes granulated over.

S. S. HOWE.

Howard, H. J.: Implantation of a Glass Ball within Tenon's Capsule by Verhoeff's Method. *Arch. Ophth.*, 1919, xlviii, 265.

Because it was found that glass balls implanted in Tenon's capsule with suturing of the muscles in front of them either came out or became displaced into a quadrant space between two of the muscles, Verhoeff developed the technique of cutting the muscles at their insertions and allowing them to retract. An 18 mm. glass ball is then inserted within Tenon's capsule and the capsule closed by means of a double armed silk suture the two ends of which are tied over a pearl button.

As the pressure of Tenon's capsule is uniform over its surface, it is impossible for the ball to become displaced and the motility of the artificial eye is said to be as good when the muscles are allowed to slip back as when they are sutured in front of the ball.

S. S. HOWE.

Sweet, W. M.: Implantation of a Metal Ball in Tenon's Capsule. *Arch. Ophth.*, 1919, xlviii, 257.

Since 1904, the author has done 146 enucleations with implantation of a metal ball in Tenon's capsule. Later extrusion of the ball occurred in only 4 cases. The conclusions drawn are as follows:

1. In practically every case the stump gives a more movable artificial eye than ordinarily follows simple excision. In some cases of enucleation in which the muscles have been sutured to the conjunctiva and care is taken to preserve all conjunctival tissue, an excellent movable prosthesis is secured, but this result is uncertain.

2. With this method the depression of the tissues immediately beneath the brow and the tendency to exophthalmos of the artificial eye are less marked.

3. The floor of the orbit after healing is flat, with occasionally a slightly raised portion in the center where the implanted ball projects forward, a condition which is better than the deep, furrowed, and often irregular socket that so often follows simple enucleation.

Contra-indications are malignant growths and purulent inflammation.

In the operation described there is no greater danger of sympathetic ophthalmia than if ordinary excision were performed without implantation of the gold ball. When it does occur, the author believes it would have developed no matter what operative procedure had been followed.

S. S. HOWE.

Van der Heydt, R.: Fundus Pathology with the Red-Free Light of Vogt. *Am. J. Ophth.*, 1919, ii, 334.

The examination of the fundus by means of red-free light discloses many details not observable by ordinary illumination, e. g., the yellow coloring of the macula, the yellow discoloration in the lens in age, and the nerve striations of the retina in optic atrophy. While with ordinary illumination no changes are observed in the atrophic eye except those of atrophy at the nerve head and its vessels, with the red-free light we find a total absence of the retinal striations and a thin whitish line, ordinarily invisible, on either side of the vessels.

Vogt has described honeycomb-like changes in the macula which are visible only in the red-free light. These vacuole formations he believes are due to cystic degeneration of the macula. The bursting of some of their thin anterior walls accounts for the condition which is known as "hole in the macula."

As many conditions can be seen better with ordinary light than the red-free light, it is not expected that the former will be superseded. Rather will the red-free be regarded merely as a valuable and helpful aid in the diagnosis. S. S. Howe.

EAR

Goeckerman, W. H., Barlow, R. A., and Stokes, J. H.: The Diagnostic Value of Lowered Bone Conduction in Syphilis. *Am. J. Syphilis*, 1919, iii, 240.

The following conclusions are presented relative to the diagnostic value of lowered bone conduction in syphilis:

1. The so-called lowered bone-conduction test (reduction in conduction of sound by bone as compared with otherwise normal hearing) was positive in 78 per cent of known syphilitics in the series studied.

2. From the otologic standpoint the test is of value only if a complete hearing test is made.

3. The efficiency of the test varied greatly in different types of syphilis, being at its best in late cutaneous syphilis (100 per cent), latent syphilis (80 per cent), and syphilis of the central nervous system (80 per cent). It had almost no value in osseous lues, and the results in early syphilis were inconclusive (too few cases). A negative Wassermann test combined with a negative bone conduction test is strong evidence of the absence of syphilis.

4. The test agreed with the positive or negative diagnosis of syphilis in 67 per cent, and disagreed in 33 per cent.

5. The test was positive also in 48.7 per cent of patients in whom syphilis could apparently be excluded.

6. On the whole, therefore, the test has only a restricted value as a diagnostic aid owing to its high factor of error. O. M. Rott.

Fraser, J. S., and Garretson, W. T.: The Radical and Modified Mastoid Operations; Their Indications, Technique, and Results, with Notes on Labyrinthine and Intracranial Complications of Chronic Middle-Ear Suppuration. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Otol., 29.

The conclusions reached are based on an analysis of 306 cases of chronic middle-ear suppuration as follows: cases treated by a radical mastoid operation, 238; cases in which a modified radical mastoid operation was performed, 17; labyrinthitis, 26; intracranial complications, 25.

The indications for the radical operation were: (1) chronic suppurative otitis media and failure of conservative treatment, 33 cases; (2) chronic suppurative otitis media with polypi or granulations, 93 cases; (3) chronic suppurative otitis media with pain, mastoid tenderness, and polypi, 57 cases; (4) chronic suppurative otitis media, acute exacerbation and subperiosteal abscess, 10 cases; (5) chronic suppurative otitis media, posterior perforation, with or without cholesteatoma, 10 cases; (6) chronic suppurative otitis media, attic perforation, with or without cholesteatoma, 24 cases; (7) chronic suppurative otitis media with a sinus over the mastoid, 4 cases; and (8) failure of previous mastoid operation, 17 cases.

The authors prefer to try the modified radical operation instead of the radical (1) when good hearing remains in the diseased ear, and (2) when there is moderate hearing in the diseased ear and the other ear is distinctly deaf.

In the matter of technique the method of skin grafting described by Marriage was used in all except 13 cases for the following reasons: (1) the presence of symptoms of fistula; (2) erosion of the canal; (3) exposure of the dura of the middle fossa; (4) exposure of the middle fossa, giddiness, and abnormality of the canal prominence; and (5) exposure of the sigmoid sinus by disease and erosion of the lateral canal.

In discussing the results of the radical operation when skin grafting was not done, the authors state that of 171 patients, 107 presented themselves for inspection at periods of from three months to five years afterward. Three of these 107 were patients who had had both ears operated upon, so that 110 of the 178 ears treated were seen. Of these, 37 appeared to be cured, while 10 others were very satisfactory except that they showed want of care (an accumulation of wax and desquamated epithelium). This gives 43 per cent of cures. In 24 cases the inner wall of the cavity was moist but there was no pus. In 27 cases there was still some purulent discharge. In 1 case the cavity was filled with cholesteatoma. In 3 cases a false membrane had formed, almost shutting off the deeper part of the cavity. In 4 cases there were granulations in the cavity. One showed a keloid in the mastoid scar and a large amount of debris in the cavity. In 35 cases the hearing was improved, in 36 there was no change, and in 22 it was worse.

Of the 63 patients upon whom skin grafting was done, 44 presented themselves for inspection at periods of from three months to two and a half years after operation. Two of these were patients who had had both ears operated upon, so that 46 of the 70 ears treated were seen. Of these, 20 appeared to be cured and 12 others were quite satisfactory except that they showed want of care. In 7 cases the inner wall was red and moist. In 4 cases a slight purulent discharge persisted, and in 1 case there was a foul-smelling profuse discharge. Two cases showed a membrane-formation with a narrow opening into it through which pus drained when the patient performed Valsalva's experiment. In 12 cases the hearing was improved, in 16 there was no change, and in 6 it was worse.

Twelve of the 17 patients upon whom a modified radical operation was performed reported after operation. Of these the condition of 9 was quite satisfactory. In 3 cases the cavity was still moist. In 10 cases the hearing was improved, in 1 it was unchanged, and in 1 it was worse. O. M. Rott.

Tod, H.: Septic Infection of the Lateral Sinus Accidentally Injured During the Operation of Mastoidectomy. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Otol., 62.

Tod reports six cases of septic infection of the lateral sinus accidentally injured during the mastoid operation. On the basis of these he draws the following conclusions:

1. Whenever the lateral sinus is exposed during the mastoid operation, it should be carefully inspected at the end of the operation to see if it has been injured in the slightest degree.

2. If the sinus-wall has been injured the wisest procedure is to expose it freely on each side and obliterate its lumen completely by means of gauze packing well beyond the affected area. This procedure is suggested by the fact that septic infection of the lateral sinus does not occur when the sinus-wall has been cut clean through and its lumen at once obliterated by pressure to arrest the hæmorrhage.

3. There may be no evidence of infection of the lateral sinus until about the tenth day after the mastoid operation, when a sudden rigor may be the first symptom. As a rule, however, there is pyrexia with increased pulse-rate for one or two days previous to this. These symptoms should be looked upon as danger signals, and if there be no other cause for them the mastoid wound should be reopened, the sinus wall explored, and if necessary incised.

4. If hæmorrhage occurs from the mastoid wound a few days after the operation, it is not sufficient to arrest it by applying pressure to the bleeding spot. The bone should be removed from the sinus wall above and below the affected area and gauze plugging inserted between the bone and the outer wall of the sinus, the sinus then being slit up and explored. Further surgical treatment depends upon what is found. Hæmorrhage from the sinus after the mastoid operation means that the wall has been injured or that it was already infected at the time of the operation. Hæmorrhage associated with pyrexia or a rigor always means septic infection of the lateral sinus and indicates an immediate and thorough operation.

5. The internal jugular vein should always be ligated in cases of septic infection of the sinus in which hæmorrhage has occurred, as in these cases the thrombus is probably diffuse and the walls of the sinus already infected even to a greater extent than is evident to the naked eye.

6. Intermittent pyrexia of a septic type without rigors, beginning after an interval of about ten days after the mastoid operation, should always suggest blood infection through the lateral sinus and warrants exposure of the sinus and probably its obliteration after exploration. This condition must not be confused with the intermittent pyrexia which may occur for some days after an operation for acute inflammation of the mastoid, the result of scarlet fever or streptococcal infection, which is probably due to toxic absorption from the affected wound surface itself and usually subsides without further surgical interference. O. M. Rott.

Eagleton, W. P.: The Reconstruction of the Mastoid Wound Cavity by the Use of Bone Grafts and Chips. *Laryngoscope*, 1919, xxix, 272.

Eagleton discusses reconstruction of the mastoid wound cavity by the use of bone grafts and chips, reporting his experience in two cases. In one the transplantation was done at the time of the mastoid operation, and in the other, with better results, at a secondary operation following the sterilization of the wound cavity by the Carrell-Dakin method. In both cases, however, the ultimate result was ideal, a smooth, flat surface covering the former mastoid cavity.

The advantages cited for this method of closure are that: (1) it does away with the painful dressings; (2) decreases the possibility of secondary infections, and (3) decreases the possibility of a recurrence of the original infection.

The prerequisites to this method of closure are: (1) the eradication of the infection by a complete operation with a perfect aseptic technique at the time of operation; (2) the filling in of the cavity of the mastoid so that no extensive vacant spaces will remain for the accumulation of blood in which the remaining bacteria and those in the neighboring middle ear may propagate; (3) the erection of a barrier posterior to the iter tympanni et antri, in order that, though a cavity is left into which the mucous membrane of the middle ear can proliferate, this cavity is small—an antrum—and thus imitates nature's process of repair. O. M. Rott.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Laurens, G.: Local Anæsthesia in Otorhinolaryngology (De l'anesthésie locale en oto-rhino-laryngologie). *Presse méd.*, Par., 1919, xxvi, 300.

Local anæsthesia may be employed for all operations on the face, ears, and upper respiratory tract, and is better than general anæsthesia. If analgesia is incomplete the fault is generally the surgeon's and due to faulty technique, haste during the operation, or rough manipulation. Either the infiltration or regional methods of inducing local anæsthesia may be used and at times both may be combined. The advantages to the surgeon and patient are: simplicity, minimum toxicity, and, in laryngeal operations, diminution in the shock and asphyxia.

The surgeon must inspire absolute confidence in the patient and assure him that the pain will be reduced to a minimum. The psychic, suggestive, and moral effect must not be overlooked. The technique ought to be above reproach, the anatomical points known exactly, and the instrumentarium correct. Gentleness is essential in dealing with the tissues, and in opening the cranium and sinuses an electric motor should be used instead of the gouge and mallet. The anæsthetic should consist of a 2 per cent novocaine solution with the addition of 25 drops of adrenalin for each 100 cubic centimeters. A larger amount of adrenalin makes possible the occurrence of postoperative hæmorrhage, hæmatomata, and abscesses.

To anæsthetize the laryngeal cavities in the course of thyrotomy and laryngectomy the author recommends injecting a solution of cocaine through the cricothyroid membrane. W. A. BRENNAN.

Lannois: Radium Therapy of Tumors in Otorhinolaryngology (La radium thérapie des tumeurs en oto-rhino-laryngologie). *Bull. Acad. de méd.*, Par., 1919, lxxxi, 638.

Lannois gives a short historical review of the radium treatment of tumors of the upper respiratory tract and reports 43 cases treated in this way by himself. These included 16 amygdaloid tumors, 6 tumors of the nose and sinuses, 4 tumors of the nasopharynx, 3 tumors of the ear, and 14 laryngeal tumors.

Tubes containing radium bromide in amounts of 28, 30, 48, and 60 milligrams were used. The strongest dose possible was employed and the tube left in place for at least twenty-four, and often for as long as thirty-six or forty-eight hours. Although in some cases a second application was necessary, it was deferred as long as possible owing to the risk of burns, etc. There was only 1 severe complication of this kind.

In the 16 cases of amygdaloid tumors there were 6 recoveries. These tumors were lympadenomata or sarcomata. Many of the others cases have been improved. Of the 6 cases of nasal tumors the majority were cured. In the 4 cases of nasopharyngeal tumors the results were good. Most of the growths in the latter group were sarcomata. In the 14 cases of laryngeal tumors there were 3 recoveries but these were not definite. The laryngeal tumors were mostly epitheliomata.

In general, the condition of patients with malignant tumors which are not epitheliomata has been improved and often completely cured by the use of radium, but in cases of epitheliomata, especially soft ulcerous epitheliomata, the results are not so good. Ectodermic epitheliomata as a rule do not yield to radium or at least the result is doubtful.

While the general results of radium treatment are therefore encouraging, the clinical and histological data establishing the indications and contra-indications for its use require further investigation. W. A. BRENNAN.

Kernan, J. D., Jr.: A Case of Tuberculosis of the Sphenoid. *Laryngoscope*, 1919, xxix, 276.

Kernan reports a case of tuberculosis of the sphenoid sinuses in a colored woman aged 31 who complained of prostration, chills, and fever, and pains radiating from the occipital region to the mastoids and later extending to the orbital regions. The patient had lost 20 pounds in six months.

Examination of the nose revealed disease of the right sphenoid. At operation friable granulation tissue was removed which proved to be tuberculous. Radical removal through the antrum relieved the symptoms. O. M. ROTT.

THROAT

Cheatham, T. A., Jr.: Tonsillectomy—Indications and Contraindications. *South. M. J.*, 1919, xii, 267.

Cheatham discusses the indications and contra-indications for tonsillectomy. The indications are: (1) chronic hypertrophy of the tonsils which interferes with phonation, deglutition, respiration, or audition; (2) repeated attacks of acute tonsillitis; (3) persistent glandular involvement following tonsillitis; (4) chronic caseous degeneration of the crypts; (5) recurring peritonsillar abscess; (6) chronic inflammation of adjacent tissues; (7) tuberculosis in which no contra-indication is present; (8) tumors; (9) focal infection; and (10) subnormality.

The contra-indications are: (1) normal tonsils; (2) hæmophilia; (3) the presence of epidemics, particularly those gaining entrance through the upper

respiratory tract; (4) anæmia; (5) acute purulent processes of the mouth, throat, nares, or accessory sinuses; (6) acute pulmonary tuberculosis; (7) acute febrile diseases; (8) acute surgical conditions; (9) infancy and old age, especially when less radical measures have not been tried; and (10) syphilis.

O. M. Rott.

Lewis, F. O.: Removal of Tonsils and Adenoids under Local Anæsthesia. *Therap. Gaz.*, 1919, xliii, 328.

Lewis states the advantages of local anæsthesia as compared with general anæsthesia as follows:

1. With local anæsthesia there is less danger of starting up an old tuberculous lesion of the lungs which occurs so frequently when general anæsthesia is universally employed.

2. General anæsthetics have been known to produce nephritis, cardiac and respiratory failure, and insufflation pneumonia.

3. No cases of abscess of the lung have been reported following tonsillectomy under local anæsthesia.

4. It is available when general anæsthesia is contra-indicated as in chronic nephritis, respiratory disorders, pulmonary tuberculosis, etc.

5. Local anæsthesia has an advantage in the rapidity with which the operation may be done without the shock which follows a general anæsthetic.

6. When the case is uncomplicated, local anæsthesia is a time-saver and requires fewer assistants.

Local anæsthesia is contra-indicated in children under 10 years of age, in secondary operations, when there have been repeated attacks of peritonsillar abscess, and in highly neurotic adults or those with extremely sensitive throats.

One-half per cent novocain with 1 drop of 1-1000 adrenalin to each dram of the anæsthetic is preferred, one dram of the mixture being injected between the capsule and muscle of each tonsll. The same solution is used for adenoids.

O. M. Rott.

Gatewood, L.: A Simple, Safe, and Rapid Tonsil Enucleation Technique for Local or General Anæsthesia. *Laryngoscope*, 1919, xxix, 285.

Through the loop of the snare the tonsil is grasped with an 8-inch curved mouse-tooth forceps the blades of which are about 1½ inches long. As much of the tonsil as can be grasped is included in the bite. The upper blade is fixed by firm pressure into the capsule, just below the superior angle of the converging pillars, and the lower jaw of the forceps is then pressed to the same depth, seizing the inferior reflexion of the capsule. The handles are then locked, sufficient pressure being used to prevent the dislodgment of the blades. The forceps are then drawn inward and rotated so that the convexity is inferior and serves for the tongue depressor which is now discarded. A curved tonsil elevator is used to lift the anterior pillar from the tonsil. The elevator is introduced with the concavity facing the operator at the upper loose attachment of the pillar by gentle pressure. The mucous surface of the anterior pillar is undisturbed because the tonsil is dislodged from behind the anterior pillar by sliding the latter and its covering membrane away from the tonsil. The anterior margin of the capsule is now brought into view. The operation is completed with a snare shaped to cut from before backward. This is accomplished by using heavy No. 10 piano wire in an ordinary snare handle bent into a semi-diamond shape.

O. M. Rott.

Irish, H. E.: Retropharyngeal Abscess in Children; Diagnosis and Case Reports. *Illinois M. J.*, 1919, xxxv, 227.

Irish discusses, with case reports, the diagnostic problems of retropharyngeal abscesses. In the first place, the attention is drawn to the position of the lymph glands back of the pharynx. Some are placed at the juncture of the posterior and lateral surfaces of the pharynx and at the apex of the lateral masses of the atlas. Usually they are two in number. In front they are in relation with the posterior wall of the pharynx; behind, with the rectus capitis anticus major which separates them from the lateral masses of the atlas; externally, with the constrictors of the pharynx and through the latter with the internal carotid artery; and internally, nearly 2 centimeters distant from the middle line.

The parapharyngeal glands are the superior glands of the internal jugular chain into which the vessels from the retropharyngeal glands empty.

To abscesses of the first group the term "retropharyngeal abscess" is applied and to those of the second group the term "parapharyngeal abscess."

The salient points in the diagnosis are:

1. An antecedent history of an inflammation in a tissue tributary to these glands.

2. The age of the patient is under 3 years as these glands usually atrophy at that age.

3. There may be an interval of apparent improvement after which the patient becomes progressively worse.

4. There is fever and leucocytosis.

5. The cry suggests the cry of a duck.

6. Dysphagia evidenced by aversion to swallowing food or drink.

7. Noisy mouth breathing and dyspnœa which is increased on lying down.

8. Hacking dry cough, also increased on lying down.

9. Head is held backward and erect.

10. The discovery of a swelling on inspection and palpation.

Emphasis is given to a proper technique in inspection and palpation. The technique advised is as follows: The child is seated on the nurse's knee with the arm nearest the nurse passed to her back. The nurse holds the child closely to her with one arm

with its face to the light, and with the other holds the child's free hand. The physician stands directly behind the child and grasps its occiput firmly in one hand to rotate or extend the head so as to bring it into the best line of vision or light. The other hand inserts the tongue depressor to the base of the tongue and makes a slight forward traction. The physician's gaze is directed from above and just under the upper incisor teeth to the pharynx. O. M. ROTT.

Ramos, A.: The Treatment of Laryngeal Tumors with Radium (Las aplicaciones de radium en los tumors de laringe). *Med. Ibera*, 1919, vii, 20.

For the treatment of laryngeal tumors the author uses 12 milligrams of radium bromide salt enclosed in a silver tube 1/10 millimeter thick with a lead filter 1 millimeter thick, the whole covered with rubber. The radium is introduced by the natural routes.

The region is anæsthetized with a 10 per cent cocaine solution. If the nasal fossæ are healthy and the tumor is lateral, the application is made by the fossa on the side of the larynx on which the tumor is situated. Otherwise, the other fossa is anæsthetized. The stylet, around which a piece of cotton soaked in the cocaine has been rolled, is pushed by the root of the naris as far as the posterior part of the pharynx. The palatal velum, the base of the tongue, and the laryngeal surface of the epiglottis are also anæsthetized.

By a series of manœuvres based on the technique of Jiminez Encima the radium tube is put into position and fixed through the mouth and naris. The author's custom is to place it at the level of the upper surface of the tongue when the lesion is endolaryngeal, and at the height of the palatal velum for pharyngeal tumors.

The transition from anæsthesia to sensibility under the action of cocaine is so slow in this region that the presence of a foreign body is well borne and the radium tube can be left in place for from four to eight hours. Treatment may consist of as much as nine hours of radiation each day for five or six days. After an interval of twenty days another treatment is given if an examination shows it to be necessary. W. A. BRENNAN.

MOUTH

Hartzell, T. B.: Discussion of the Factors to be Considered in Determining Whether to Extract or Conserve Diseased Teeth. *Am. J. Surg.*, 1919, xxxiii, 97.

It is conceded by most pathologists that the majority of heart, joint, and kidney infections have their origin in the mouth. The streptococcus viridans has been isolated by numerous observers from the heart's blood and ulcerating surfaces of the hearts of persons who have died from endocarditis.

The author submits figures from the United States Bureau of Vital Statistics showing that the death rate from heart disease is far greater than that from tuberculosis. Heart disease is therefore a greater menace than tuberculosis, but to a very great extent is preventable by proper mouth sanitation.

The principal source of infection is the enormous growth of streptococcus viridans in the oral cavity and on tooth surfaces, whence it enters the circulation through pyorrhœa pockets, chronic dental abscesses, and tonsil crypts. Hartzell reports an interesting case proving these facts.

Recently there has sprung into being a great group of medical men and a few dentists who, to control the death rate from mouth infection, vigorously assail the conservationist and ruthlessly sacrifice many valuable teeth. The problem that confronts every man practicing medicine and dentistry is what to do with diseased teeth and under what conditions is the removal of necessary teeth justified in order to prevent greater ills than those which arise from the improper mastication of food. M. N. FEDERSPIEL.

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